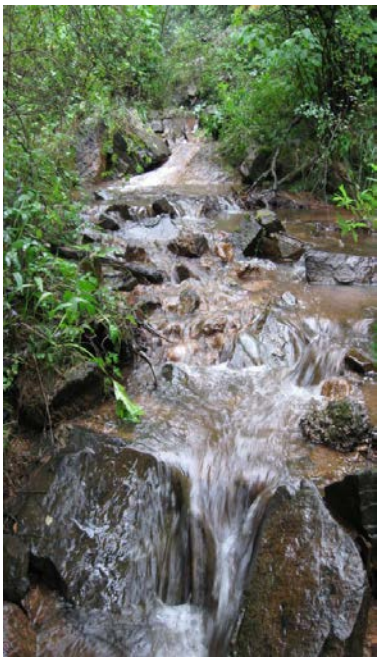
United States Department of Agriculture

Forest Service

Pike and San Isabel National Forests, Cimarron and Comanche National Grasslands
Pikes Peak Ranger District



FINAL

Bear Creek

Watershed Assessment

August 2013

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Introduction

The greenback cutthroat trout (*Oncorhynchus clarkii stomias*), Colorado's state fish, is native to the east side of Continental Divide in Colorado. Historically, it was thought to have occupied the Arkansas and South Platte River watersheds; however, recent genetic analysis indicates it occurred only in the South Platte River watershed (Metcalf et al. 2012). The greenback cutthroat trout is currently listed as threatened under the Endangered Species Act (ESA). Extensive surveys have failed to identify any extant populations of the greenback cutthroat trout in the South Platte watershed. At present, the sole known remaining population of genetically pure greenback cutthroat trout inhabits Bear Creek, a tributary of Fountain Creek, itself a tributary of the Arkansas River (Metcalf et al. 2012).

The Bear Creek watershed is located in El Paso and Teller Counties, about five miles southwest of Colorado Springs (Figure 1). It is an important recreation area along the Front Range of Colorado, providing motorized and non-motorized recreation opportunities on a well-established trail network. Slopes in the watershed are steep, the soils are highly erodible, and parts of the watershed are at risk from large-scale, high-intensity wildfire. In response to public and agency concerns about the vulnerability of the Bear Creek population of the greenback cutthroat trout, an interdisciplinary team of resource specialists prepared this comprehensive review of activities in the watershed.

Regulatory Basis

The Code of Federal Regulations (CFR) Title 36, Part 212 provides the regulatory basis for travel management on National Forest System (NFS) lands. Specifically, 36 CFR 212, subpart B provides for a system of NFS roads, NFS trails, and areas on NFS lands that are designated for motor vehicle use. Section 212.55 of 36 CFR 212 states that in designating roads, trails, and areas on NFS lands for motor vehicle use, the responsible official shall consider effects on natural and cultural resources, public safety, provision of recreational opportunities, access needs, conflicts among uses of NFS lands, the need for maintenance and administration of roads, trails, and areas that would arise if the uses under consideration are designated; and the availability of resources for that maintenance and administration.

In addition, in designating trails and areas on NFS lands, the responsible official shall consider effects on the following, with the objective of minimizing: 1) damage to soil, watershed, vegetation, and other forest resources; 2) harassment of wildlife and significant disruption of wildlife habitats; 3) conflicts between motor vehicle use and existing or proposed recreational uses of NFS lands or neighboring federal lands; 4) conflicts among different classes of motor vehicle uses of NFS lands or neighboring federal lands; and 5) compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.

Forest Service Manual (FSM) 7710 contains objectives, policies, responsibilities, and requirements for travel planning in accordance with 36 CFR 212. The objectives of travel planning (FSM 7710.2) are:

- To provide for a safe and cost-effective transportation system.
- To provide for orderly improvement and management of the forest transportation system and documentation of decisions affecting the system.
- To determine the minimum road system needed for sustainable public and agency access to achieve the desired conditions in the applicable land management plan; to promote ecosystem

health; and to address public safety and efficiency of operations in an environmentally sensitive manner within current and anticipated funding levels.

- To determine appropriate motor vehicle uses of NFS roads, NFS trails, and areas on NFS lands.
- To designate NFS roads, NFS trails, and areas on NFS lands for motor vehicle use.
- To provide for and manage an appropriate range of motorized and non-motorized recreational experiences (FSM 2350), while minimizing conflicts among uses.
- To provide access for the use and enjoyment of NFS lands.

FSM 7712 outlines travel analysis, which assesses the current forest transportation system and identifies issues and assesses benefits, problems, and risks to inform decisions related to identification of the minimum road system per 36 CFR Part 212.5(b)(1) and designation of roads, trails and areas for motor vehicle use per 36 CFR Part 212.51. Travel analysis is not a decision-making process. Rather, travel analysis informs decisions relating to administration of the forest transportation system and helps to identify proposals for changes in travel management direction. Direction on travel analysis includes:

- Use travel analysis (Forest Service Handbook [FSH] 7709.55, chapter 20) to inform decisions related to identification of the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of NFS lands per 36 CFR 212.5(b) (1) and to inform decisions related to the designation of roads, trails, and areas for motor vehicle use per 36 CFR 212.51.
- Travel analysis for purposes of identification of the minimum road system is separate from travel analysis for purposes of designation of roads, trails, and areas for motor vehicle use. Travel analysis for both purposes may be conducted concurrently or separately.
- Any proposals resulting from travel analysis for either purpose may be addressed in the same or different environmental analyses.
- When proposing to revise designations, consider using travel analysis as appropriate, depending on the scope of the proposed revisions.
- Responsible officials may use travel analysis to inform decisions relating to regulation of over-snow vehicle use on NFS roads, on NFS trails, and in areas on NFS lands (36 CFR Part 212, Subpart C; FSM 7718).
- Responsible officials may use travel analysis to inform travel management decisions involving non-motorized uses.
- A roads analysis conducted at the scale of an administrative unit that was completed in accordance with U. S. Forest Service (USFS) publication FS-643, “Roads Analysis: Informing Decisions About Managing the National Forest Transportation System,” satisfies the requirement to use travel analysis relative to roads.
- Decisions to add roads to the forest transportation system must be informed by travel analysis conducted at an appropriate scale (FSM 7703.26).

Figure 1 Location Map

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Step 1: Setting Up the Analysis

The purpose of this step is to:

- Establish an interdisciplinary team that includes specialists from relevant disciplines.
- Develop a list of data needs and a schedule for completing the analysis
- Identify the appropriate scope and scale of the analysis
- Establish a complete and accurate inventory of NFS roads and trails
- Consider opportunities to integrate travel analysis with watershed analysis or landscape assessments

Objectives

The objectives for the Bear Creek watershed assessment are to:

- Synthesize existing resource and infrastructure information
- Complete the Travel Analysis process in compliance with 36 CFR 212 (specifically considering the criteria in 36 CFR 212.55), FSM 7710, and FSH 7709.55.
- Use Travel Analysis as a means to concurrently complete a watershed assessment
- Develop a set of recommendations that may be used as proposed actions for future National Environmental Policy Act (NEPA) analysis

Scope and Scale

The scope of the assessment refers to the range of potential recommendations to be considered. This assessment considers the existing transportation system, including non-system routes to the extent that data exist on these routes. It considers potential changes to the transportation system, including construction, reconstruction, maintenance, decommissioning, or obliteration of roads or trails. Other designations, such as seasonal closures, the types of uses allowed, and whether to include roads or trails in the recommended system are considered. Both motorized and non-motorized uses are considered in the assessment. Over-snow use is considered but this is a minor concern because terrain and snow cover are generally not conducive to over-snow vehicle use. The scope of the assessment also includes actions not directly related to the transportation system that would protect or improve conditions in the Bear Creek watershed, such as improvement of riparian habitat or reduction of wildfire risk.

The scale of the assessment refers to the geographic extent at which it is conducted. Based on the presence of the greenback cutthroat trout, the Bear Creek watershed (Figure 2) was selected as the appropriate scale for most resources addressed in this assessment. The analysis area for the transportation system was extended beyond the watershed boundary to include routes that are closely connected to those in the Bear Creek watershed (Figure 2). The purpose of this extension was to fully capture the effects of any recommendations with regard to road and trail management. This assessment will make

recommendations about both the minimum transportation system and designation of routes in the analysis area.

The time frame for the assessment refers to the period during which the information in this assessment is relevant to the Bear Creek watershed, providing a sound basis for management decisions. No discreet time frame is set for this assessment. At some point in the future, the Forest Plan will be revised and may alter management direction for the analysis area. Future travel analysis may also change the recommendations for the area. New information about resources that could affect the value of recommendations in this assessment may also be developed.

Analysis Plan

This watershed assessment follows the process outlined in FSH 7709.55, chapter 20 for travel analysis, which is based in part on USFS publication FS-643. Although the process was developed for travel analysis, it is appropriate for a watershed assessment because it uses an interdisciplinary, resource-based approach to identify concerns and recommend solutions. This is particularly true in the Bear Creek watershed, where the transportation system is closely connected to several major resource concerns. Any solution to existing problems in the watershed is likely to include changes to the transportation system. By combining travel and watershed analysis, this assessment will be able to take an efficient yet meaningful approach to identifying issues and providing recommendations for future action.

A six-step process was used in developing this watershed assessment. The steps are designed to be sequential, with the understanding that the process may require feedback and iteration among steps over time as an analysis matures. The amount of time and effort devoted to each step differs by project based on specific situations and available information. The process yields a set of possible issues and questions for analysis, and the answers can inform choices about management of the watershed. Decision-makers and resource specialists evaluate the relevance of each question, incorporating public participation as deemed necessary. The steps followed in this watershed assessment include:

- Step 1: Setting Up the Analysis
- Step 2: Describing the Situation
- Step 3: Identifying Issues
- Step 4: Assessing Benefits, Problems, and Risks
- Step 5: Describing Opportunities and Setting Priorities
- Step 6: Reporting

Completion of Step 1, including this analysis plan sets the stage for the assessment. The subsequent tasks to complete are:

- Describe the analysis area and current transportation system
- Identify important issues through public involvement and interdisciplinary team (IDT) participation
- Evaluate and identify the resource effects caused by the transportation system and assess if the system meets Forest Plan and other current management direction and needs

- Describe and prioritize the options for modifying the transportation system to achieve the desired goals
- Produce the final report and maps

FSH 7709.55, chapter 20 lists the following requirements for reporting of travel analysis:

- A list of the key issues
- A prioritized list of the risks and benefits associated with changing the part of the forest transportation system under analysis
- A prioritized list of opportunities for addressing those risks and benefits
- If applicable, a prioritized list of actions or projects that would implement the minimum transportation system
- If applicable, a list of proposed changes to current travel management direction, including proposed additions to or deletions from the forest transportation system

This report includes recommendations for management actions not associated with the transportation system. These recommendations are complementary to proposed changes to the transportation system. Together, they are designed to improve the health and function of the Bear Creek watershed and minimize risks to the greenback cutthroat trout. As a combined watershed assessment and travel analysis, this report meets all requirements for reporting of travel analysis. In addition, it provides the basis for future proposed actions in the Bear Creek watershed that relate to other issues and concerns independent of the transportation system.

Interdisciplinary Team Members

Table 1 lists the IDT members assigned to this project and the responsibilities of each member. Individual resource questions were answered by the assigned individual or through a collaborative effort of various resource specialists, depending on the level of analysis needed to answer the question.

Table 1 Interdisciplinary Team Members

Name	Title	Responsibility
Denny Bohon	Zone Fisheries Biologist	Aquatic Biology/Fisheries/Invasive Species
Dana Butler	Zone Hydrologist	Hydrology/Soils
Cait Cuddihy	Engineering	Engineering
Rick Ellsworth	Recreation Field Supervisor	Recreation
Allan Hahn	District Ranger	Responsible Official
Tom Healy	Law Enforcement Officer	Law Enforcement/Protection
Jeff Hovermale	Lands and Minerals	Access/Minerals/Land Use
Frank Landis	Recreation Staff	Recreation
Jerri Marr	Forest Supervisor	Reviewing Official
Sue Miller	Special Uses	Special Uses

Table 1 Interdisciplinary Team Members

Name	Title	Responsibility
Felix Quesada	District Wildlife Biologist	Terrestrial Wildlife/Ecosystem Function
Priscilla Riefkohl	Zone Archeologist	Cultural Resources
Kirsta Scherff-Norris	Wildlife Biologist	Colorado Springs Utilities (CSU) Liaison
Matt Schweich	Natural Resource Specialist	IDT Leader
Janelle Valladares	GIS Specialist	GIS Analysis/Mapping
Mike Welker	Forest Wildlife Biologist	Public Affairs
Eric Zanotto	District Fire Management Officer	Fire/Fuels/Vegetation

Information Sources

Data to be used in the assessment were generally from existing sources. New field data were collected in limited cases as noted below. The following information sources were consulted. A more detailed list of these sources can be found in the References section of this report.

- The Land and Resource Management Plan (Forest Plan) for the Pike and San Isabel National Forests, Cimarron and Comanche National Grasslands (PSICC) and amendments, the Environmental Impact Statement (EIS) and Record of Decision (ROD) for the Forest Plan, including maps of relevant management areas (MAs)

- Regulatory documents - 36 CFR 212, FSM 7710 – Travel Planning, FSH 7709.55 – Travel Planning, USFS publication FS-643, Region 2 (R2) supplement to FS-643

- Corporate database and Geographic Information System (GIS) information, such as data on roads and trails, Road Management Objectives (RMOs), travel routes, soils, watersheds, streams, vegetation, fuels, and wildlife habitat

- Scientific literature

- The recently completed Bear Creek Watershed Trails Assessment (Rocky Mountain Field Institute [RMFI] 2012)

- The recently completed High Drive Road Assessment (CH2M Hill 2013)

- Special-use permit information

- Land ownership and mining claim information

- Cultural resource sites/investigations/context discussion

- Maintenance plan and budgeting information

Figure 2 Analysis Area

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Step 2: Describing the Situation

The purpose of this step is to:

- Summarize current land management and travel management direction
- For the watershed and the portion of the forest transportation system under analysis, produce:
    - A map
    - An inventory of NFS roads, trails, and areas
    - An assessment of existing uses
    - A description of public and administrative access needs
    - An assessment of recreation opportunities
    - Information about environmental, social, and other issues
    - A summary of existing travel management decisions
    - An assessment of available resources to manage the watershed and maintain and operate the forest transportation system

Land Management Direction

There are two identified agreements in place that guide management of use and activities in portions of the analysis area. The first, an Act of Congress on February 27, 1913, designated approximately 14,843 acres in the Pike National Forest to be "reserved from all forms of location or entry and set aside as a municipal water supply reserve for the benefit of the City of Colorado Springs…" This agreement covers a small portion of the western end of the watershed. The second is an agreement, dated January 9, 1924, for the purposes of conserving and protecting the water supply of the City of Colorado Springs. This agreement covers the remainder of NFS lands in the watershed not covered by the 1913 act.

The Forest Plan, as amended, provides programmatic management direction for the PSICC. Through its goals, standards and guidelines, and MA direction, the Forest Plan provides the overall guidance for management of NFS land within the PSICC's borders.

The Forest-wide standards and guidelines in the Forest Plan that apply to this project are primarily those regarding cultural resources (page III-17), recreation (pages III-19 to III-24), fish and wildlife (pages III-28 to III-32), water resources (pages III-50 to III-52), special uses (pages III-68 to III-69), rights-of-way and lands (pages III-69 to III-71), soil resources (pages III-72 to III-74), transportation (pages III-74 to III-80), and fire and fuels (pages III-81 to III-82) and are hereby incorporated by reference.

The Forest Plan divides the PSICC into individual MAs and designates specific direction, goals, standards, and guidelines to be used in the management of each area to meet its emphasis more completely. Applicable direction for the three MAs in the analysis area is summarized below.

Semi-primitive Motorized Recreation (MA 2A): This MA covers 773 acres (33 percent) of NFS lands in the analysis area. MA 2A emphasizes semi-primitive motorized recreation opportunities, such as snowmobiling, four-wheel driving, and motorcycling, both on and off roads and trails. Motorized travel may be restricted or seasonally prohibited to protect physical and biological resources. General direction for dispersed recreation management is to prohibit motorized vehicle use off roads and trails where needed to protect soils, vegetation, or special wildlife habitat (page III-109). Standards and guidelines for MA 2A are found in the Forest Plan on pages III-107 to III-115.

Riparian Area Management (MA 9A): This MA covers 141 acres (6 percent) of NFS lands in the analysis area. The management of all component ecosystems of riparian areas is emphasized. These components include the aquatic ecosystem, the riparian ecosystem, and adjacent ecosystems within 100 feet of perennial streams, lakes, and other water bodies. Each of these components is managed together as an integrated riparian area. The goals of management are to provide healthy self-perpetuating plant communities, meet water quality standards, provide habitats for viable populations of wildlife and fish, and provide stable stream channels. General direction for transportation system management is to locate roads and trails outside riparian areas unless alternative routes have been reviewed and rejected as being more environmentally damaging (III-214). Standards and guidelines for MA 9A are found in the Forest Plan on pages III-204 to III-215.

Municipal Watershed (MA 10E): This MA covers 1,417 acres (61 percent) of NFS lands in the analysis area. MA 10E emphasizes protecting or improving the quality and quantity of municipal water supplies. Management practices vary from use restrictions to water resource improvement practices, with the primary objective of meeting water quality standards established for the individual watershed. A secondary objective is to manage the watersheds to improve the yield and timing of water flows, consistent with water quality requirements. General direction for dispersed recreation management is to allow motorized travel only on established roads and trails. Close the watershed to all travel when the road or trail surfaces could be damaged to the degree that water quality could be degraded (III-234). Standards and guidelines for MA 10E are found in the Forest Plan on pages III-233 to III-241.

The PSICC GIS database also shows six acres of the analysis area in MA 2B (Rural and Roaded Natural Recreation). However, the Forest Plan MAs were drawn at a relatively coarse scale. In this case, the drawn boundary roughly follows a ridgeline that is also the watershed divide. This was interpreted to mean that the Bear Creek side of the ridge was meant to be in MA 2A, while the North Cheyenne Creek side of the ridge was meant to be in MA 2B. The six acres for MA 2B calculated by the GIS were assigned to MA 2A for this assessment, as that is the adjacent MA in Bear Creek.

Travel Management Direction

Direction for travel management is provided by the Forest Plan. As noted in the introduction, 36 CFR 212 provides the regulatory basis for travel management on NFS lands. Specifically, 36 CFR 212.51 addresses designation of NFS roads, NFS trails, and areas on NFS lands for motor vehicle use. 36 CFR 212.56 requires that designated roads, trails, and areas be identified on a motor vehicle use map (MVUM). MVUMs are available to the public at Forest Service offices and on Forest Service websites. MVUMs specify the classes of vehicles and, if appropriate, the times of year for which use is designated. An MVUM has been published for the Pikes Peak Ranger District, which includes the analysis area for this assessment. This MVUM portrays the status of the transportation system analyzed in this assessment to the extent information was available at the time of publication of the MVUM. Alteration of the MVUM may be needed based on new information or if changes to the transportation system are implemented.

Analysis Area Description

The analysis area for the Bear Creek watershed assessment is located four to eight miles west-southwest of downtown Colorado Springs, Colorado, on the east flank of Pikes Peak (Figures 1 and 2). The majority of the area is in El Paso County, with a small portion in Teller County. The area contains 3,602 acres, of which 2,331 acres are managed by the Pikes Peak Ranger District of the PSICC. Other ownership includes Colorado Springs Utilities (CSU) (840 acres), the City of Colorado Springs (City) (406 acres), and private landowners (25 acres).

Physical Environment

Elevation in the analysis area ranges from 11,400 feet on an unnamed spur ridge of Almagre Mountain at the west end of the watershed to 6,800 feet along Bear Creek at the east end. More than 80 percent of the slopes in the analysis area are greater than 30 percent. The watershed is composed primarily of Pikes Peak granite, a coarse-grained biotite and hornblend-biotite granite, which is very susceptible to weathering. Pegmatites in the rocks of the Pikes Peak batholith offer some of the best mineral collecting opportunities in Colorado. This area has produced fine specimens of amazonite, fluorite, bladed hematite crystals, phenakite, smoky quartz, and topaz. The Pikes Peak granite forms very erosive, granitic soils, interspersed with areas of exposed bedrock. The soils are rocky, shallow, and coarse textured with thin organic layers. These soils are particularly vulnerable to rill and gully erosion if protective ground cover is removed. Erosion potential is higher on steep slopes and adjacent to less permeable surfaces such as rock outcrops or compacted areas. Once disturbed, they are difficult to rehabilitate.

Bear Creek begins as a series of small tributaries above Jones Park (Figure 3). From Jones Park, it descends steeply through a rocky canyon for one mile before a steep, narrow, and rocky section ("the falls") is encountered. Downstream of the falls, the stream maintains a relatively constant gradient until it exits the canyon near Gold Camp Road in Colorado Springs. Downstream of Gold Camp Road, it flows through Bear Creek Park, crossing under 21st Street and 8th Street, south of the former gold mill at Gold Hill Mesa. The stream eventually flows into Fountain Creek near the Martin Drake Power Plant. Fountain Creek is a tributary of the Arkansas River.

Biological Environment

The Bear Creek watershed contains a diverse mix of vegetation. At the higher, western end, subalpine species such as bristlecone pine, Engelmann spruce, limber pine, and aspen, are dominant. Farther east, the montane zone consists of sapling, pole, and mature stands of ponderosa pine, Douglas-fir, white fir, limber pine, and quaking aspen. At the lower, east end of the watershed, montane species are still dominant, but Gambel oak becomes an important component of many stands. Non-forested cover types comprise about five percent of the watershed and include rock outcrops or barren areas. Stream courses are dominated by stands of quaking aspen or mixed conifer species, with an understory of riparian plants, including some willows. Fire suppression has altered much of the vegetation in the watershed, 90 to 95 percent of which is considered to be in Fire Regime Condition Class 3.

The diverse vegetation types in the watershed provide habitat for an assortment of wildlife. One species of particular importance is the North American beaver. A series of four beaver ponds that encompass about 0.3 acres are located along Bear Creek in a relatively confined meadow in the upper, northwestern portion of the watershed. The watershed contains the suitable habitat for several species (other than the greenback cutthroat trout) listed as threatened under the ESA or designated as sensitive in Region 2 of the USFS including the Preble's meadow jumping mouse (PMJM) and Mexican spotted owl (MSO), both federally listed threatened species. Region 2 sensitive species that may occur include the fringed myotis, hoary bat, olive-sided flycatcher, flammulated owl, northern goshawk, and peregrine falcon. Other sensitive species have not been documented in the watershed, but are likely to occur in suitable habitat.

At present, the sole known remaining population of genetically pure greenback cutthroat trout inhabits Bear Creek. The greenback cutthroat trout is currently listed as threatened under the ESA. Greenback cutthroat trout are also considered an aquatic Management Indicator Species (MIS) for the PSICC. The population occupies about 4.1 miles of Bear Creek of which 3.4 miles are considered fully occupied and the remaining stream is considered transitional habitat. No other fish species are present in the watershed.

Human Environment

The majority of people who use the Bear Creek area are residents of Colorado Springs and surrounding communities in El Paso and Teller counties. Several multiple-use trails provide the primary focus for recreational activities. Most are open to motorcycle use and all are open to non-motorized use. The area is also popular for mountain bicycling. The amount of non-wheeled use is limited because of the high volume of motorcycles and mountain bikes. The area receives very little hunting or fishing pressure and is currently closed to fishing to protect the greenback cutthroat trout. CSU and Colorado Springs Park, Recreation, and Culture Services have completed a Master Plan for opening and developing the south slope of Pikes Peak for day-use activities. Implementation of this plan is currently on hold.

The trail system is desirable for events and guided trips because of its proximity to Colorado Springs. Special use permits have been issued in the past for guided hunting, hiking, foot races, horse trail rides, mountain bike clinics and races, and to access mountain climbing areas. The U.S. Army is authorized to use 16 landing zones on NFS lands under special use permit, including four landing zones in the Bear Creek watershed.

Since the original USGS effort in 1871, National Forest boundaries have not been resurveyed or posted. No unauthorized uses or improvements on NFS lands have been identified. No formal records of ownership or maintenance responsibility have been identified for the portion of High Drive that crosses NFS lands. There are no other known reservations, outstanding rights, or other encumbrances. On June 22, 2011, CSU submitted a letter to the Pikes Peak District Ranger expressing a desire to convey approximately 1,172 acres of City lands in the Jones Park area to the USFS. No further action has been taken on this letter.

Two previous cultural resource surveys and four recorded historical sites have been identified in the analysis area. There are no documented prehistoric sites. High Drive and almost all of the trails in the analysis area are historic properties. Though not documented, it is possible that several of the historic trails were developed on older American Indian trails. Tribal consultation is in progress. To date, we have no knowledge of traditional cultural properties in the analysis area.

Roadless Areas and Wilderness

There are no designated wilderness or roadless areas (per the 2012 Colorado Roadless Rule) in the analysis area.

Existing Transportation System

The existing transportation system considered in this analysis is summarized in Table 2, described in detail in Table 3, and shown in Figure 2. The transportation system, particularly the trail system, was not so much constructed as developed in place based on historic and possibly prehistoric travel routes. Many of the routes do not meet modern standards in terms of gradient, drainage, or proximity to streams. There are no changes to the transportation system that have been approved but not yet implemented.

One road, High Drive, is considered in this analysis. In recent years, this road has been open seasonally to all vehicles and yearlong to non-motorized use; however, it has been closed to motorized use since

sustaining significant damage during a storm event in June 2012. The City of Colorado Springs, which maintains the road, intends to re-open it to all uses on a seasonal basis once funds become available to repair the road to a safe condition for public use.

Nine trails are considered in this analysis. Three (622, 622.A, and 666) are open yearlong to all non-motorized uses (for example, hiking, mountain biking, or horseback riding). In addition, a small portion of the western end of Trail 667 is not open to motorized use. The remaining six (665, 667, 668, 701, 720, and 720.A) are multi-use, open to both motorized and non-motorized uses, with the exception of the non-motorized portion of Trail 667. Motorized use is limited to motorcycles; ATVs and larger motorized vehicles are not allowed. Throughout this analysis, these trails are referred to as "motorized" trails, although they are open to non-motorized use as well.

As described in Step 1, this assessment includes transportation routes in the Bear Creek watershed, as well as connecting routes outside the watershed. Table 2 summarizes the existing transportation system by route type and location in or out of the Bear Creek watershed. Table 3 contains additional information on each trail, including land ownership and permissible uses.

Table 2 Existing Transportation System – Summary

Route Type	In Watershed (miles)	Out of Watershed (miles)	Total (miles)
Road	2.19	1.21	3.40
Motorized trail	7.93	9.96	17.88
Non-motorized trail	2.04	2.57	4.61
Total	12.16	13.73	25.89

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Table 3 Existing Transportation System – Detail

Route Number	Route Name	Ownership	Length (miles)*	Access	Notes
Roads					
380	High Drive	City of Colorado Springs	1.64	Seasonal, motorized, all vehicles. Yearlong non-motorized.	High Drive has been closed to motorized use (other than administrative) continuously since a severe rainstorm caused damage in June 2012.
		Private	0.29		
		U. S. Forest Service	1.47		
		Road Subtotal	3.40		
		Roads Total	3.40		
Trails					
622	Seven Bridges	Colorado Springs Utilities	0.11	Yearlong, non-motorized	
		U. S. Forest Service	1.60		
		Trail Subtotal	1.71		
622.A	Seven Bridges – North Spur	Colorado Springs Utilities	0.57	Yearlong, non-motorized	
		Trail Subtotal	0.57		
665	Penrose	City of Colorado Springs	1.13	Yearlong, motorized, single track	
		U. S. Forest Service	1.07		
		Trail Subtotal	2.20		
666	Bear Creek	City of Colorado Springs	0.31	Yearlong, non-motorized	
		U. S. Forest Service	1.72		
		Trail Subtotal	2.04		
667	Jones Park	Colorado Springs Utilities	0.19	Yearlong, non-motorized	Also known as the “Captain Jacks” or “Buckhorn” trail
		U. S. Forest Service	0.10		
		Non-motorized Subtotal	0.29		
		Colorado Springs Utilities	2.78	Yearlong, motorized, single track	
		Private	0.07		
		U. S. Forest Service	3.77		
		Motorized Subtotal	6.62		

Table 3 Existing Transportation System – Detail

Route Number	Route Name	Ownership	Length (miles)*	Access	Notes
		Trail Subtotal	6.91		
668	Pipeline	Colorado Springs Utilities	0.82	Yearlong, motorized, single track	
		U. S. Forest Service	2.46		
		Trail Subtotal	3.28		
701	Foresters	Colorado Springs Utilities	0.51	Yearlong, motorized, single track	
		U. S. Forest Service	3.46		
		Trail Subtotal	3.97		
720	Foresters Cutoff	Colorado Springs Utilities	1.23	Yearlong, motorized, single track	
		U. S. Forest Service	0.31		
		Trail Subtotal	1.53		
720.A	Foresters Cutoff – North Spur	Colorado Springs Utilities	0.28	Yearlong, motorized, single track	
		Trail Subtotal	0.28		
		Trails Total	22.49		
		Roads and Trails Total	25.89		

Figure 3 Existing Transportation System

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Step 3: Identifying Issues

The purpose of this step is to:

- Identify key issues affecting the watershed and that portion of the forest transportation system under analysis. Use appropriate public involvement to identify these issues.
- To identify key issues, determine in the context of the analysis:
    - The primary public concerns related to the watershed and travel management
    - The primary management concerns related to the watershed and travel management
    - The primary legal constraints on management of the travel and the watershed
    - The amount of resources and skills available to conduct the analysis
- Determine the data needed to analyze the key issues and whether the data are available or must be obtained.

Public Involvement Process

Public involvement is a necessary and informative component of travel analysis. Input from the IDT, other USFS resource specialists, external agency representatives, and the public contributed to the development of the issue statements used in this analysis. No public meetings were conducted specific to this project. The following public involvement activities were implemented to inform the public about the project and to provide an opportunity to comment.

- A page was developed on the PSICC's web site to allow public access to project documents and maps. The web site included a list of ways to comment on the project.
- A news release was distributed to local and regional media outlets on October 26, 2012 to increase public awareness of the project. The news release included a link to the project web page and a list of ways to comment on the project.

Comments were received from 45 individuals or organizations. In the news release, we asked for comments to be provided by December 1, 2012; however, we continued to receive comments after this date. All comments received by January 4, 2013 have been incorporated into this document. Specific comments were analyzed and are summarized below. These comments were used in part of generate the issue summary later in this section.

- Access
    - High Drive should be further analyzed, re-located, or closed if warranted to reduce sediment input to streams, and adjacent stream habitat restored.
    - Access to mining claims should be addressed.
    - Access should be available for all user groups. Trail closures will restrict access.

  - Will the temporary closure become permanent?

- Aquatic Species and Habitat
  - Effects of existing and proposed roads and trails on fish should be addressed.
  - Sediment should be removed and pools restored in Bear Creek.
  - Maybe Bear Creek is not the right place to manage for greenback cutthroat trout.
  - There is no proof motorcycle use is affecting fish; simply closing the trail will not help the fish.
  - Removing motorized and non-motorized uses from Bear Creek would protect the fish and its habitat.
  - Monitor and report fish and habitat health.
- Cultural Resources
  - Effects of the transportation system on cultural resources should be addressed.
- Information / Education / Enforcement
  - Informational signs should be installed.
  - Enforcement presence should be increased.
- Land Use
  - Effects of Forest Service management on other landowners should be addressed.
  - Coordinate with other landowners for uniform land use rules.
- Process
  - The best solution to this problem will be achieved through a collaborative, locally driven approach.
  - The solution should not exclude anyone / any group.
  - The USFS should use best available information / science, not follow the wishes of a non-local organization.
  - The process should be moved forward as quickly as possible.
- Recreation
  - Captain Jack's trail (also known as Jones Park trail or Trail 667) should be kept open to motorcycles. The current trail does not need to be closed or re-routed.
  - The trail should be closed to all use.

- The area should be kept open to Off Highway Vehicle (OHV) use while concerns with fish and fish habitat are analyzed and addressed.
- OHV use reduces foot traffic, camping, etc.
- Sustainability of existing trails should be analyzed.
- User-created routes and features (fire rings, campsites, etc.) should be addressed and disturbed areas restored. Social trails should be blocked and sensitive areas fenced with informational signs.
- The Bear Creek watershed should be closed to travel off designated routes and dispersed camping.
- All trails (motorized and non-motorized) should be relocated or redesigned to reduce sediment input to streams. Old alignments should be rehabilitated.
- The trail should be re-aligned, but not closed to OHV use.
- If the trail is closed to motorcycles, it should be closed to all users.
- An effort should be made to save the trail and the fish.
- Detailed recommendations for trail construction on steep slopes were provided.
- Detailed re-route options for Trails 666, 667, 701, 720.A, and 622.A were provided.
- Trail 667 should be re-routed to the south side of Kineo Mountain and connect to Trail 668.
- Bridges should be added on Trail 666 to reduce mountain bike erosion.
- Trail 666 should be closed to all but foot traffic and shored up to prevent erosion.
- Recreational use should be non-motorized and no horses.
- If the whole system is closed, user groups should be allowed to propose other trails. If motorcycle use is restricted on this trail, open another nearby trail to motorcycles.
- Trail maintenance should be done with government materials and volunteer labor.
- Trails crossings of the creek should use structures that ensure use of the bridge and do not allow traffic in the creek.
- Once the watershed assessment and consultation are complete, trails should be re-opened to motorized use until re-alignments are completed. Close the existing trail once re-alignments are completed.
- If the conditions of the settlement have not been achieved by spring, open a loop using 668, 701, and 720 to allow riding from Frosty Park.
- Consider other options such as closing the 667 trail during the spawning season only, etc.

- Social Issues
    - I / we have a strong attachment to or personal / family history with this area.
    - This area / the trails provide a unique opportunity (single-track motorized close to Colorado Springs).
    - The motorized community has worked hard to improve sustainability of the trails through collaborative volunteer efforts.
    - Keep public lands open to all the public.
    - Closing the whole system to all users or one user group would be unjust.
    - Closing the area to motorized use and ignoring other sources of sediment is discriminatory and creates an atmosphere of distrust.
- Special Use Permits
    - Effects of special use permits (recreational events, military exercises) should be addressed.
- Vegetation
    - Risk of large-scale wildland fire in the watershed should be addressed.
- Watersheds
    - Effects to water quality in a municipal watershed should be addressed.
    - If sediment in the stream is the issue, the trail should be closed to all users.
    - Detailed recommendations for reducing erosion and sedimentation in Bear Creek were provided.
    - Monitor and report water quality.
    - Construct major structures at key locations for erosion mitigation.
- Wildlife
    - Effects of the transportation system on wildlife resources should be addressed.

Issue Summary

The following issues have been identified based on public, IDT, USFS, and other agency input. The order of presentation of these issues does not reflect their importance to the public, IDT, USFS, or other agencies.

Access

The transportation system provides access to lands owned or managed by the USFS, CSU, City, and private landowners. It also provides access to existing, valid mining claims. Access will be needed in the future for landowners, managers, and others. Various user groups have a desire for access. Closure of roads or trails, both in the short-term and long-term, may restrict access for landowners, managers, mine claimants, or user groups.

Aquatic Species and Habitat

The rarity and small population size of the greenback cutthroat trout in Bear Creek increases the level of concern with any existing activities or potential disturbances that could affect the quality of stream habitat. Future management of the watershed should focus on providing quality habitat for the greenback cutthroat trout. The existing transportation system, user-created routes, and other ground disturbance can affect riparian areas, stream habitat, and fish populations, primarily through increasing rates of soil erosion and sedimentation, as well as alteration of stream temperature and flow. The high level of use increases the risk of aquatic invasive species becoming established in the watershed. Existing habitat conditions suggest the need to restore habitat and reduce sediment input to the stream. Reducing or removing human uses from the Bear Creek watershed may improve conditions for the fish and its habitat. Continued monitoring of the health of the fish population and its habitat is needed.

Cultural Resources

Use and maintenance of the transportation system have the potential to damage or destroy prehistoric or historic cultural resources.

Economics

Maintenance of the transportation system presents an ongoing cost to the USFS. Cost is an important factor in establishing the minimum transportation system. Contributions by volunteer groups can partially offset these costs. The long-term budget outlook is for decreased funds for road and trail maintenance. Any changes to the transportation system should consider long-term maintenance needs, including cost. The cost of constructing and maintaining sustainable roads and trails in a watershed with highly erosive soils and a threatened fish must be carefully weighed against the benefits of providing for public use on those roads and trails.

Information, Education, and Enforcement

Information and education efforts can be combined with increased enforcement actions to improve behavior of users and decrease the incidence of unwanted activities. Any solution should include appropriate information, education, and enforcement actions.

Land Use

Land ownership is divided between the USFS, CSU, City of Colorado Springs, and private landowners. Any solution needs to consider effects on all landowners. Solutions should be coordinated among landowners to provide clarity and consistency for all users of the area. The solution also needs to be adaptable to future changes in land ownership.

Recreation

The Bear Creek watershed and connecting roads and trails are heavily used for recreation by both motorized and non-motorized users. Several user-created routes have developed and are used primarily by foot traffic. Sustainability and maintenance of the trail system are challenged by limited funds, difficult

conditions (for example, steep slopes and erosive soils), and heavy use. Some of the trails are located close to Bear Creek. Many trails are eroding and contributing sediment to the stream. Re-route options have been explored to move the trail away from the stream and increase sustainability. Construction and maintenance of new trails as well as maintenance and rehabilitation of existing trails will require major investments over a long period.

Social Issues

Users of the transportation system have strong attachment or history in this area. Some users have worked for many years to improve sustainability of the trails through collaborative volunteer efforts and feel significant attachment to the area. Some users feel that closing the area to one user group is unjust and that public lands should be open to all the public, while others feel this is an acceptable solution. Other users feel that if the area is closed to one user group, it should be closed to all.

Special Uses

Existing (for example, military helicopter landing zones) and proposed (for example, equestrian events) special uses pose a risk of increased erosion, sedimentation, and the introduction of pollutants into Bear Creek.

Vegetation

Much of the vegetation in the watershed has been affected by past management including fire suppression and is significantly altered from the historic range of variability. The risk of large-scale, high intensity wildfire is high. The risk of natural and human-caused ignitions is high. Combined with erosive soils, any large wildfire has the potential to lead to catastrophic damage to the watershed.

Watersheds

Roads and trails on steep slopes and highly erosive soils are prone to excessive erosion. This sediment can be transported to streams, affecting fish habitat. Sediment also affects water quality, a key concern in municipal watersheds like Bear Creek. Engineering solutions can be used to reduce erosion and sediment production from roads and trails, although the cost of these solutions must be carefully weighed against the benefits provided by the transportation system. Continued monitoring of watershed conditions is needed.

Wildlife

Use of the transportation system can affect use of the area by wildlife species and the quality of wildlife habitat. Expansion of the beaver population could provide a low cost method of improving riparian and stream habitat, as well as improving flow regimes during dry periods.

Step 4: Assessing Benefits, Problems, and Risks

The purpose of this step is to:

- Examine the major uses and environmental, social, and economic effects of the portion of the watershed and forest transportation system under analysis. Analyze the risks and benefits associated with the current situation.

This section summarizes the benefits of, problems with, and risks from the current transportation system. It is based on answers to the 73 questions from FS-643 (USFS 1999) that are specific to the Bear Creek watershed and the transportation system being analyzed. More complete answers to the 73 questions are contained in Appendix A.

Aquatic, Riparian Zone, and Water Quality

At present, the sole known remaining population of genetically pure greenback cutthroat trout inhabits Bear Creek. The entire watershed is of exceptionally high importance for aquatic species because of the presence of the trout. Many features of aquatic habitat had declined by 2011 compared with 1994. Pool area, maximum pool depth, and average pool depth declined significantly. Glide habitat increased significantly because of sediment aggradation. The amount of large woody material had increased by 2011. The extent of eroding stream bank remained stable. Cover declined in each reach (Winters et al 1994, Gallagher 2011).

Existing condition is most influenced by a road and trails network with heavy recreational use. Studies by the USFS indicate High Drive and the trails may be significant contributors of sediment to Bear Creek. According to the High Drive assessment (CH2M Hill 2013), “much of the system is currently not functional due to accumulated sediment.” The road surface, as well as cut and fill slopes are composed of unvegetated and highly erosive decomposed granite. Some drainage structures such as ditches and culverts are filled with sediment and not functioning. Concentrated storm flows are eroding road surfaces, ditches, fill slopes, and the surrounding hill slopes, creating gullies and transporting sediment into Bear Creek and its tributaries. RMFI (2012) noted that much of the trail system is poorly located, has non-functioning or poorly functioning trail drainage, and has not been adequately repaired or maintained. The transportation system accounts for 62 acres of bare ground, while non-system routes account for another 14 acres of disturbance. Almost the entire area (97 percent) has a high soil erosion hazard. These soils may require considerable expense to control erosion and sedimentation.

Roads and trails, particularly High Drive and Trails 666 and 667, are hydrologically connected to Bear Creek where they are located in the WIZ and at stream crossings. About 40 percent of the system is located in the WIZ. At many crossings, the stream channel is over-widened and the stream banks have a very high erosion rate. Roads and trails have the potential to cause pollutants to enter streams. This risk is most acute where the travel route is located in the WIZ and at stream crossings. Sediment is the primary variable of concern with regard to water quality in Bear Creek. Bear Creek is not a 303(d) listed stream.

Wetlands have likely been affected over the years along High Drive and Trails 666 and 667; at the stream crossings associated with High Drive and Trails 666, 667, 668, 701, and 720A; and along the social trails along Bear Creek from the caretaker’s house in Bear Creek Park to Josephine Falls. The risk of the transportation system altering channel dynamics increases with proximity to Bear Creek. The transportation system has caused the loss of approximately three acres of riparian vegetation.

Upstream movement of trout through the bridge openings at creek crossing #4 on High Drive may be restricted in high flow events. There are three fords on Trail 666. At each of these sites, the channel is over-widened, the water is shallow, and movement of fish could be restricted in low flow periods.

High Drive provides easy access to the stream. Repeated use of sites and routes has denuded stream banks and short slopes between the road and stream. Social trails along Bear Creek are common from Josephine Falls down to the caretaker's house in Bear Creek Park. The transportation system may facilitate illegal fishing. A small number of people illegally use the area for camping. It is common to find small rock dams and other in-stream modifications in Bear Creek, which lead to over-widening of the stream channel and direct disturbance of fish and spawning areas.

Terrestrial Wildlife

Recreational use of the transportation system has degraded habitat and caused habitat loss and fragmentation. About 62 acres of habitat have been lost to roads and trails. Habitat conditions adjacent to travel routes are generally degraded by the use of these features for recreation. Riparian areas have been degraded by the use and proximity of the trail system and High Drive to Bear Creek. Travel routes also provide access to unique or sensitive habitats.

Ecosystem Functions and Processes

Roads and trails are potential avenues for the introduction and spread of noxious weeds. Non-native plants are more common along High Drive than in the rest of the watershed. The road and trail system also facilitates recreational activities that have the potential to introduce or spread parasites and disease. Roads and trails increase the risk for wildfire because they allow access for human activities that are a potential ignition source. Unintentional ignitions may occur from recreational shooting, an escape from a prohibited campfire, or flammable debris from a motorcycle lacking a spark arrestor. Wildland fire originating from the transportation system may cause detrimental effects to the watershed. Human recreational use of roads and trails is the main source of noise. Wildlife response to noise causes physiological and behavioral responses that can reduce reproduction and survival. Noise also exacerbates the problems posed by habitat fragmentation and wildlife responses to human presence. Noise disturbance is most pronounced on motorized trails.

Economics

The transportation system generates relatively little direct revenue, but has historically produced substantial grant funding and volunteer labor. In recent years, USFS funding for road and trail maintenance has decreased. Future funding is likely to continue to decrease. No easement exists granting the City right-of-way for the 1.5 miles of High Drive on NFS lands; however, the City maintains the road in its entirety under informal agreement. No certainty exists for future maintenance of High Drive. The analysis area is not a fee-use area so the transportation system does not generate any direct revenue from user fees.

Timber Management

Timber management is not a concern because timber management is not a Forest Plan objective in the Bear Creek watershed.

Minerals Management

The majority of NFS lands in the analysis area are open for mineral entry. About 280 acres at the west end of the watershed are withdrawn from mineral entry. There are currently four active, unpatented mining claims in the area. Right of reasonable access for purposes of prospecting, locating, and mining is provided by statute. High Drive provides motor vehicle access to the area's trail system for access to the mining claims.

Range Management

Range management is not a concern because there are no active range allotments in the analysis area.

Water Production

CSU has a water right and infrastructure in place to withdraw water from Bear Creek for municipal use; however, it does not currently do so. Municipal use of water from Bear Creek is planned in the future. There are no hydroelectric sites in or downstream of the analysis area.

Special Forest Products

Collection of special forest products is not a concern because the existing transportation system is not used for this purpose.

Special-use Permits

Special-use events and guided trips are expected to continue to be in high demand. Currently, they require consultation with the USFWS for each permit. USFS policy does not require a field inspection for recreation events, nor are they currently conducted in the Bear Creek watershed for outfitter / guide permits or the military landing permit.

General Public Transportation

The trail system provides access to two large blocks of land owned by the City. The City manages the eastern block, Bear Creek Canyon Park, while CSU manages the western block (the Jones Park area). High Drive also provides access to seven patented mine claims under private ownership, which remain undeveloped. High Drive is managed by the City. No documentation has been found establishing ownership, rights-of-way, or easements for the portion of High Drive that crosses NFS lands. The multiple use single-track trail portion of the transportation system represents the largest risk to the safety of users. Motorcycle riders, mountain bikers, equestrians, and hikers can all experience conflict with their own and other groups. Even on non-motorized trails, conflict can occur between users. The high level of use increases this risk. At the same time, trail conditions serve to limit speed, reducing the physical danger.

Administrative Use

The transportation system facilitates on-going monitoring of the greenback cutthroat trout population and its habitat. Both roads and trails are used for this monitoring, which would be more difficult and time consuming without the transportation system. Law enforcement staff spends very little time on the trail system. Few if any violations are recorded along the trail system. The mixed jurisdiction of lands in the watershed is a complicating factor.

Protection

Thick vegetation and heavy fuels are consistent throughout the watershed. High Drive and the trail system provide little access to potential fuel treatment areas. Crews respond to an average of two fires a year in this area. These fires have been limited in size, ranging from less than one acre up to 10 acres. Two-thirds of the fires have been human-caused, with the remainder caused by lightning. The risk of large-scale fire is high. The transportation system directly affects fire suppression. Steep slopes and lack of roads largely prohibit use of engines and vehicles. Response time is greater than other areas because of the condition of the transportation system. Any fire that escapes initial attack would likely burn a large portion of the watershed at high intensity. This would place a potentially large number of forest users at risk. Firefighters may not be able to enter the area if adequate escape routes and safety zones are not available. Airborne dust emissions occur but do not seem to be high enough to reduce visibility or cause human health concerns.

Roaded and Unroaded Recreation

The motorized trails are single track, which is unique in this area. The trails also have value to mountain bike users. The proximity of the trailhead to the City makes access and use very convenient and extremely popular. The demand for single-track use far exceeds the available opportunities. Any change to the types and legal access of routes would be substantial, especially for motorcycle and mountain bike users. It is estimated that more than 30 percent of the motorcycles using these trails do not have USFS approved spark arresting devices. This can lead to noise levels above state requirements and a higher risk of wildfire. The jurisdiction of Penrose Trailhead is unclear and little or no enforcement is done at this location. Noise and other effects from motorized recreation almost certainly have reduced non-motorized use of the trail system.

The users of the transportation system in and around the Bear Creek watershed are diverse and numerous. Many have strong attachments, opinions, and feelings about the area and its recreational opportunities. Convenience and proximity to the population base, the unique and historic motorized single track, and the quality of natural experience all contribute to a strong sense of place. Some users have worked for many years to improve sustainability of the trails through collaborative volunteer efforts and feel significant attachment to the area.

Illegal squatters have been known to occupy campsites for long periods because of the proximity to the urban area. This use carries the risk of watershed damage and wildfire.

Passive-use Value

The entire Bear Creek watershed is considered an area of exceptionally high importance for aquatic species because of the presence of the greenback cutthroat trout. All potential activities in the watershed may affect the greenback cutthroat trout as well as the Mexican spotted owl and Preble's meadow jumping mouse. Connected activities in the adjacent North Cheyenne Creek watershed have the potential to affect the same species.

At the time of early Spanish incursions into Colorado, the mountains and the western slopes were considered Ute territory, while the eastern plains were occupied by several different groups. Despite clear evidence of use and sacred significance of adjacent localities, the USFS has no present knowledge of cultural, symbolic, spiritual, sacred, traditional, or religious values specific to the area.

While there are likely some people, both locally and nationally, that place a value on the existing transportation system, the greatest value associated with the transportation system is actual use, particularly the well-known "Captain Jack's" trail. Conversely, there are likely many more people, both locally and nationally, that place a high passive-use value on the existence of the unique greenback cutthroat trout population.

Social Issues

Residents of the Colorado Springs area place a high value on their ability to access the transportation system. Changes may be difficult for some users to accept. The Bear Creek Roundtable was established to encourage diverse groups to work together on solutions for the watershed.

A record search and literature review identified two cultural resource surveys and four recorded cultural sites, all historical. No prehistoric sites have been recorded. Several tribes, including the Utes, Comanche, Kiowa, Arapaho, and Cheyenne made use of the area. The USFS has no knowledge of traditional cultural properties in the Bear Creek area. The Bear Creek watershed is rich in historical sites. Preliminary background research identified that High Drive and almost all system trails are historic properties. It is possible that High Drive and other routes are potentially eligible to the NRHP. In addition, the concentration of historic features suggests that the Bear Creek area has potential as a historic district. Cultural resource sites can be put at risk by travel management actions or decisions. Already, many of the travel routes have been adversely affected by recreational use, erosion control, and maintenance actions, as well as natural causes and neglect. There are no known paleontological sites in the Bear Creek watershed or along surrounding trails.

Management of the transportation system in the Bear Creek watershed likely has no measureable effect on the social and economic health of Colorado Springs, which has a large population and diverse economy. Nevertheless, the transportation system is important to local residents who use this area and to the businesses that support this use. There are no industries dependent on forest-related resources in the traditional sense because Colorado Springs has a large and diverse economy.

The transportation system in the Bear Creek watershed does not affect wilderness attributes because there is no wilderness in or near the analysis area.

Civil Rights and Environmental Justice

All user groups have the potential to be affected by the management of the transportation system in an equal manner. Human uses are not connected to a particular group in terms of ethnicity or income. There may be some connections with disability or age. Individuals with some disabilities or in an older age class may not be able to pursue non-motorized use, but may be able to pursue motorized use. The "Captain Jack's" and other trails require a high level of experience and physical ability that is not substantially different than the level of physical ability needed for non-motorized use. Therefore, changes to the motorized and non-motorized transportation system are not expected to affect particular groups of people in terms of disability or age.

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Step 5: Describing Opportunities and Setting Priorities

The purpose of this step is to:

- Identify opportunities and priorities and formulate proposals for changes to management of the watershed and the forest transportation system that respond to the issues, risks, and benefits identified in the preceding steps.

- Compare motor vehicle use of the portion of the forest transportation system under analysis with desired conditions established in the applicable land management plan, and describe options for modifying the forest transportation system that would achieve desired conditions.

- Identify any unauthorized roads, trails, and areas that should be considered for designation.

Important Note: **As this is a watershed assessment, recommendations were developed for the watershed as a whole, regardless of land ownership. The USFS only has the ability to make management decisions on NFS lands. Implementation of these recommendations on lands managed by the City and CSU would require decisions by these agencies and would be independent of any decisions made by the USFS. Nothing in this analysis should be considered a suggestion or requirement on the part of the USFS for the City or CSU to take any action or alter management in any way on lands they manage. The USFS is committed to working closely with the City and CSU to implement a variety of mutually agreeable management actions that protect the Bear Creek watershed and the greenback cutthroat trout while allowing compatible human use.**

The organization of this section is based on the key issues described in Step 3. For each issue, the desired future condition is described, and then recommendations for managing the transportation system and other human uses of the watershed are listed and prioritized. Each recommendation is listed under the most closely related issue; however, in most cases, the recommendation responds to or would affect more than one issue. For example, all of the recommendations listed under the watershed issue would also serve to protect or improve habitat for aquatic species. Priorities are listed in three categories (low, medium, and high) as well as two periods (short- and long-term). Short-term high-priority recommendations are those that should be implemented as soon as feasible to maintain or improve conditions in the watershed for the greenback cutthroat trout while providing for appropriate human uses. In contrast, long-term recommendations, and those with lower priority, may require additional planning, take longer to implement, or have less immediate or direct effect on the watershed and the trout. Following the detailed description in relation to the key issues, the recommendations are summarized. A discussion of NEPA analysis needs and Forest Plan and regulatory compliance is also included in this section.

Access

Desired Future Condition: The transportation system will continue to provide access to lands owned or managed by the USFS, CSU, City, and private landowners. It will also provide reasonable access to valid mining claims. Access will be maintained for various user groups. Public access will be prohibited except on designated routes.

Recommendation: Maintain east-west connectivity between the City, through the Bear Creek watershed, and to NFS and CSU lands to the west.

> **Discussion:** High demand exists for recreational access throughout this part of the Front Range. Trails in Bear Creek and adjacent watersheds provide access and help meet this demand.

Priority: High (short- and long-term)

Recommendation: Maintain a non-motorized connection to properties managed by CSU.

Discussion: The South Slope recreation plan envisions non-motorized use of portions of CSU properties west of the Bear Creek watershed. Maintaining this connection is important to allow public access to CSU lands once the South Slope plan is implemented.

Priority: High (short- and long-term)

Recommendation: Prohibit public access in the Bear Creek watershed, except on designated routes.

Discussion: This watershed analysis recommends closing and rehabilitating several trails. In order for the rehabilitation to be successful, all public use of the closed routes should be prohibited. Any continued traffic would reduce the effectiveness of rehabilitation and pose a risk to the watershed and greenback cutthroat trout. The option for permitted or administrative use of the closed trails would remain, but should be discouraged for the same reasons. Those routes that are part of the recommended transportation system should be designated as open for appropriate uses.

Priority: High (short- and long-term)

Recommendation: Prohibit over-snow vehicle use in the Bear Creek watershed.

Discussion: Over-snow vehicle use is rare in the watershed because snow conditions are rarely sufficient for their use and because the terrain and transportation system do not lend themselves to this use. In addition, the period when over-snow vehicle use is most likely corresponds with the period of recommended closure of the transportation system to all use (see Watershed section of the recommendations).

Priority: Low (short-term), Medium (long-term)

Adaptive Management

Desired Future Condition: The critical resources in the Bear Creek watershed (cultural resource protection, greenback cutthroat trout, recreational opportunities, and watershed health) will be monitored. Thresholds for additional action will be established to address unacceptable effects if they are identified by monitoring. Actions taken will be effective at eliminating unacceptable effects and will be implemented in a timely manner.

Recommendation: Design and implement an adaptive management program including monitoring, thresholds for action, specific actions to be taken if thresholds are met, and timelines for monitoring and implementing actions.

Discussion: Adaptive management is a process of monitoring and, if necessary, modifying management actions to achieve desired results. The use of thresholds, or triggers, provides a framework for modifying or taking additional actions when unacceptable effects are identified. When additional actions are needed, they must be effective at addressing the problem and they must be implemented in a timely manner.

Priority: High (short- and long-term)

Aquatic Species and Habitat

Desired Future Condition: The Bear Creek watershed will provide quality habitat for the greenback cutthroat trout. Habitat conditions will be improved and sediment input to the stream will be reduced. The transportation system and other human uses will be managed to minimize soil erosion and sedimentation and maximize riparian vegetation. The risk of aquatic invasive species becoming established will be minimized. The health of the fish population and its habitat will be monitored.

Recommendation: Minimize all water contact.

> **Discussion:** Water contact by users has the potential to spread aquatic diseases (for example, whirling disease) and to serve as a route for introduction of pollutants. Re-routing trails out of the WIZ, reducing the number of water crossings, and developing educational materials and signs would help minimize water contact.
>
> **Priority:** Medium (short-term), High (long-term)

Recommendation: Improve stream habitat.

> **Discussion:** Although stream habitat in Bear Creek is currently functioning to support the greenback cutthroat trout, sediment has accumulated and is reducing the quality of that habitat. In-stream habitat improvements (for example, expanding pools) may increase the quality and quantity of optimal fish habitat.
>
> **Priority:** Stream reach parallel to High Drive: High (short- and long-term); other stream reaches Medium (short-term), High (long-term)

Recommendation: Harden or improve existing fish barriers.

> **Discussion:** Existing fish barriers at the lower end of the watershed are currently effective at preventing the spread of non-native trout into reaches occupied by the greenback cutthroat trout, but could be reinforced to ensure long-term exclusion.
>
> **Priority:** Medium (short-term), High (long-term)

Recommendation: Support coordinated efforts by the Greenback Recovery Team, USFS, CPW, and USFWS to establish populations of greenback cutthroat trout in other streams.

> **Discussion:** The current population is extremely vulnerable to significant loss or extinction from a catastrophic event such as prolonged drought or wildfire. In the long-term, climate change or other factors may reduce the viability of the population. A long-term, cooperative effort is needed to identify suitable streams for re-introduction of the species in its native range. By creating multiple populations in different streams, the risk of extinction would be substantially lowered.
>
> **Priority:** High (short- and long-term)

Recommendation: Determine if emergency flow augmentation is feasible or practical.

> **Discussion:** Prolonged drought, perhaps coupled with climate change, has the potential to reduce water flows in Bear Creek below levels that support a viable population of greenback cutthroat trout. Flow augmentation may serve as an emergency measure to maintain the population during low flow periods.

Priority: Low (short-term), High (long-term)

Recommendation: Extend occupied habitat in Bear Creek up and downstream from existing reach.

Discussion: The greenback cutthroat trout does not currently occupy all potentially suitable habitats in Bear Creek. Through improvement of stream habitat and fish barriers, more of the creek would be accessible to the fish, may allow for an increase in population size, and may help buffer against the uncertainties of drought.

Priority: Low (short-term), Medium (long-term)

Cultural Resources

Desired Future Condition: The transportation system and other human uses will be managed to minimize the potential for damage to or loss of prehistoric or historic cultural resources.

Recommendation: Complete heritage surveys.

Discussion: The Bear Creek watershed appears to have a high density of historic sites, including the trail system itself, and has a relatively high potential for discovery of prehistoric sites. Any new management action that may affect cultural resource, including all ground-disturbing activities (for example trail construction or rehabilitation of existing trails), requires compliance with section 106 of the NHPA, which would include completion of cultural resource surveys, determination of effects, and consultation with the State Historic Preservation Officer (SHPO).

Priority: High (short- and long-term)

Economics

Desired Future Condition: Maintenance of the transportation system will be an ongoing cost to the USFS, but management changes will be implemented to reduce those costs. Contributions by volunteer groups will partially offset those costs.

Recommendation: Implement a transportation system that is aligned with anticipated future maintenance funding, considering contributions by volunteer groups.

Discussion: USFS budgets for transportation system maintenance are limited and have the potential to decrease in the future. The future transportation system should be designed to be maintained with anticipated funding because of the importance of properly maintaining roads and trails in this watershed. Volunteer groups can contribute to maintenance, but may be limited in the scale of their efforts or may not be able to meet some needs.

Priority: High (short- and long-term)

Recommendation: Establish clear ownership and maintenance responsibilities for High Drive.

Discussion: No formal records of ownership or maintenance responsibility have been identified for High Drive. To ensure continued road maintenance on High Drive, the USFS should grant an easement to the City of Colorado Springs for the 1.5 miles of High Drive on NFS lands and establish a maintenance agreement for the road. Although these actions would not directly increase revenue for the agency, they would guarantee that road maintenance costs do not

increase. If the USFS becomes responsible for maintaining its portion of High Drive, costs would increase.

Priority: Medium (short-term), High (long-term)

Information, Education, and Enforcement

Desired Future Condition: Information and education efforts will be combined with enforcement actions to improve behavior of users and decrease the incidence of unwanted activities. The Bear Creek Roundtable, a diverse group of engaged stakeholders, is increasing public awareness and understanding of the issues in the watershed.

Recommendation: Develop and implement a program of information, education, and enforcement to increase public awareness of the importance of various resources in the watershed, as well as the challenges in managing those resources.

Discussion: Public awareness and understanding of resource values and management challenges in the Bear Creek watershed should reduce incidences of resource damage or other unwanted behaviors. The program should include regular patrols to promote education as well as law enforcement. Consider the use of volunteer groups to support this effort as appropriate

Priority: Low (short-term), High (long-term)

Recommendation: Develop and implement an interpretive strategy for fish / fish habitat and historic resources.

Discussion: The Bear Creek watershed provides habitat for a unique fish resource and appears to have a high density of historic sites that are of local significance. These resources already motivate some recreational use of the watershed. Interpreting these resources would provide additional points of interest for the public. Interpretation may mitigate effects to historical resources that may be needed for watershed protection.

Priority: Low (short-term), Medium (long-term)

Land Use

Desired Future Condition: The management of the transportation system and other human uses will be coordinated among landowners in the watershed to provide clarity and consistency for all users of the area as well as being adaptable to future changes in land ownership.

Recommendation: Develop a land ownership and management strategy that considers consolidating management, acquiring (from willing participants) private lands or lands managed by CSU, or other actions.

Discussion: The Bear Creek watershed is currently managed in partnership between the USFS, City, and CSU. Some activities (for example, trail maintenance or law enforcement) may be more efficient under consolidated ownership.

Priority: High (short- and long-term)

Recreation

Desired Future Condition: The Bear Creek watershed will provide motorized and non-motorized recreation opportunities on a sustainable road and trail system. Unsustainable system routes and all user-created routes will be rehabilitated to prevent their future use and continuing damage to the watershed.

Recommendation: Provide a motorized trail loop (single-track riding experience) that connects, at a minimum, the Penrose trailhead with Frosty Park.

> **Discussion:** The Bear Creek area provides a unique recreational experience in the Colorado Springs area – a single-track motorized riding experience adjacent to the urban area, as noted by both public comments and the IDT. This use is compatible with the Forest Plan.
>
> **Priority:** High (short- and long-term)

Recommendation: Institute a long-term ban on camping and fires.

> **Discussion:** The Bear Creek area is at high risk of a large-scale wildfire that could have severe consequences for the watershed, the greenback cutthroat trout, and recreational activities. Opportunities to reduce this risk through mechanical or prescribed fire treatments are extremely limited. A long-term ban on camping and fires would substantially reduce the risk of human-caused wildfires.
>
> **Priority:** High (short- and long-term)

Recommendation: Institute a long-term ban on recreational shooting.

> **Discussion:** Along with campfires, recreational shooting is another activity that carries the risk of causing wildfires. The watershed is not heavily used for recreational shooting now and other parts of the District provide more accessible options for this activity. Legal hunting would continue to be allowed, subject to CPW regulations.
>
> **Priority:** High (short- and long-term)

Social Issues

Desired Future Condition: The road and trail system will provide recreation opportunities similar to those available in the past, in terms of both user groups accommodated and user experiences, although at a reduced level as needed to prevent continuing adverse effects to the watershed. Changes needed to protect the watershed will be developed and implemented in a manner that effects all user groups similarly.

Recommendation: Provide recreational opportunities for all users.

> **Discussion:** The Bear Creek area has a long history of public recreational use. Many users have a strong attachment to the area and have been willing to contribute funds and volunteer efforts to maintain that use while protecting the watershed.
>
> **Priority:** High (short- and long-term)

Special Uses

Desired Future Condition: Existing and proposed special uses will be managed to minimize the risk of increased erosion, sedimentation, wildfire, and the introduction of pollutants into Bear Creek.

Recommendation: Eliminate the four landing zones.

> **Discussion:** Helicopter units from Fort Carson use 16 landing zones on lands managed by the PSICC and City of Colorado Springs under special use permit to practice maneuvers. Four of these landing zones are in the Bear Creek watershed. This use carries a risk of accidents including crashes and release of pollutants to the environment.
>
> **Priority:** High (short- and long-term)

Recommendation: Develop a set of best management practices (BMPs) for special use events and other activities.

> **Discussion:** The area receives several requests for special events annually (for example, races). Development and use of best management practices would streamline analysis and approval of special uses, including consultation with the USFWS, while protecting the watershed and greenback cutthroat trout.
>
> **Priority:** Medium (short-term), High (long-term)

Recommendation: Prohibit recreation special events until BMPs are developed.

> **Discussion:** Recreation special events have the potential to cause adverse effects to the watershed and greenback cutthroat trout. Issuance of permits requires consultation with the USFWS.
>
> **Priority:** High (short- and long-term)

Recommendation: Withdraw the entire watershed from entry for locatable and leasable minerals.

> **Discussion:** Mining, including gold panning and informal prospecting, has the potential to cause adverse effects to the watershed and greenback cutthroat trout. The area has low potential for deposits of economically recoverable minerals.
>
> **Priority:** Medium (short-term), High (long-term)

Recommendation: Contact active mineral claimants to ensure all are operating as required.

> **Discussion:** Mining has the potential to cause adverse effects to the watershed and greenback cutthroat trout. Several active mining claims exist in the watershed.
>
> **Priority:** High (short- and long-term)

Vegetation

Desired Future Condition: Vegetation will be managed to provide high quality riparian habitat and, to the extent practical, to reduce the risk of large-scale, high intensity wildfire.

Recommendation: Maximize riparian vegetation and improve riparian habitat.

Discussion: Riparian vegetation can directly influence stream habitat through shading, litter fall, contribution of large woody debris, protection of stream banks, retention of runoff and sediment, and other factors that maintain or improve habitat conditions for the greenback cutthroat trout. Riparian habitat is also important for many species of wildlife.

Priority: Medium (short-term), High (long-term)

Watersheds

Desired Future Condition: The transportation system and other human uses will be managed to minimize soil erosion, sedimentation, and other watershed damage. Watershed conditions will be monitored.

Recommendation: Minimize stream crossings, relocating trails as needed and feasible.

Discussion: Stream crossings represent one of the most direct connections between roads and trails. Minimizing these features would reduce the amount of sediment reaching the stream channel.

Priority: High (short- and long-term)

Recommendation: Minimize routes in the Water Influence Zone (WIZ), relocating trails as needed and feasible.

Discussion: Roads and trails in the WIZ are more likely to affect streams because the short distance between the route and the channel reduces the ability of vegetation or physical features to filter sediment from runoff. The proximity of routes to streams also increases the potential for people to enter riparian areas, causing loss of vegetation on banks and other effects that can reduce the quality of aquatic habitat.

Priority: High (short- and long-term)

Recommendation: Implement recommendations of the High Drive road assessment (CH2M Hill 2013).

Discussion: The current condition of High Drive causes large amounts of sediment to move off the road prism and toward Bear Creek. The road assessment for High Drive contains a series of recommendations to reduce erosion and improve the condition of the road.

Priority: High (short- and long-term)

Recommendation: Maintain, reconstruct, or re-align existing trails as needed to minimize erosion risk and sediment production.

Discussion: Many of the existing trails were not constructed to modern standards in terms of gradient, erosion control, or other features. Sediment production from these trails poses a risk to the watershed and greenback cutthroat trout. Those trails that will remain open should be maintained, reconstructed, or re-aligned to minimize the risk of erosion and sediment production.

Priority: High (short- and long-term)

Recommendation: Rehabilitate closed system trails.

Discussion: This watershed analysis recommends closing several trails, specifically trails that are close to Bear Creek. However, simply closing the trails will not reduce erosion and sediment input to the stream. A variety of permanent measures to minimize erosion (for example, construction of water bars, mulching, and revegetation) should be applied. Failure to implement such measures would pose a risk to the watershed and greenback cutthroat trout.

Priority: High (short- and long-term)

Recommendation: Close and rehabilitate unauthorized routes.

Discussion: Unauthorized routes increase the amount of disturbed ground and may not develop in sustainable locations. They may also promote undesirable activities. This watershed assessment recommends the minimum transportation system needed to accommodate sustainable public and agency access. Addition of unauthorized routes to this system is not needed for access, would pose risks to the watershed and greenback cutthroat trout, and would conflict with agency direction.

Priority: Medium (short-term), High (long-term)

Recommendation: Implement seasonal closures on roads and trails.

Discussion: Seasonal closures would reduce use of roads and trails when surface conditions are most conducive to erosion and sediment movement towards the stream.

Priority: Medium (short-term), High (long-term)

Wildlife

Desired Future Condition: The transportation system and other human uses will be managed to minimize adverse effects to wildlife. A beaver population may contribute to improvement of riparian and stream habitats, as well as flow regimes during dry periods.

Recommendation: Reduce trail density.

Discussion: Trails fragment wildlife habitat. Noise and human activity along trails reduce habitat effectiveness. Reduced trail density would increase available wildlife habitat and the effectiveness of that habitat.

Priority: Medium (short-term), High (long-term)

Recommendation: Encourage beaver colonization or expansion.

Discussion: Beavers can contribute to capture of sediment and retention of runoff through their activities. Beaver impoundments can increase aquatic habitat, improve water quality, reduce erosion, and reduce fluctuations in seasonal flows.

Priority: Low (short-term), Medium (long-term)

Summary of Recommendations

This section summarizes the recommendations of the watershed analysis. It is focused on the specific details of the recommendations, which were developed by the IDT to respond to one or more of the more general recommendations listed above. The exact extent of some of the recommendations (for example, length of trails) is approximate and may change during site-specific project design and implementation.

Access

- Prohibit public access in the Bear Creek watershed except on designated routes.
- Prohibit over-snow vehicle use in the Bear Creek watershed.

Adaptive Management

- Develop and implement an adaptive management program.

Aquatic Species / Riparian Habitat / Watershed Health

- Design and implement stream and riparian habitat improvement projects, including portions of the stream above and below the current occupied reaches.
- Harden or improve fish barriers.
- Investigate the potential for flow augmentation in emergency situations.
- Participate in interagency efforts to identify and transplant greenback cutthroat trout progeny from Bear Creek into suitable re-introduction streams.

Cultural Resources

- Complete cultural resource surveys, NRHP eligibility determinations, and SHPO consultation.

Information, Education, and Enforcement

- Develop and implement an information, education, and enforcement strategy.
- Develop and implement an interpretive strategy for fish / fish habitat and selected historic resources of significance.

Land Use

- Develop a land ownership and management strategy that considers consolidating management, acquiring (from willing participants) private lands or lands managed by CSU, or other actions.

Recreation

- Institute a long-term ban on camping and fires.
- Institute a long-term ban on recreational shooting.

Roads

- Maintain current use on the entire length (3.40 miles) of High Drive (open seasonally to full-sized, motorized vehicles, open yearlong to non-motorized use).
- Implement the recommendations of the High Drive road assessment (CH2M Hill 2013).
- Establish clear ownership and maintenance responsibilities for High Drive.

Special Uses

- Eliminate the four military helicopter landing zones.
- Develop and implement a set of BMPs for special use events and other activities.
- Prohibit recreation special events until BMPs are developed.
- Withdraw the entire watershed from entry for locatable and leasable minerals.
- Contact active mineral claimants to make sure all are operating as required and ensure compliance is achieved.

Trails

- For existing trails that remain open, maintain, reconstruct, or re-align as needed to minimize erosion risk and sediment production.
- For existing trails that are closed, rehabilitate the trail surface, cut, and fill slopes to minimize erosion risk and sediment production.
- For new trails, use modern trail design standards to prevent erosion and sediment production, as well as locating the trails outside of the WIZ and avoiding stream crossings to the extent practical.
- Implement seasonal closures of trails to all use.
- Close and rehabilitate all unauthorized routes.
- Recommendations for each trail are summarized in Table 4 and listed below. Additional details including land ownership are shown in Table 5.

Table 4 Comparison of Existing and Recommended Transportation Systems

Route Type	In Watershed (miles)		Out of Watershed (miles)		Total (miles)	
	Existing	Recommended	Existing	Recommended	Existing	Recommended
Road	2.19	2.19	1.21	1.21	3.40	3.40
Motorized trail	7.93	4.51	9.96	10.79	17.88	15.30
Non-motorized trail	2.04	2.18	2.57	1.53	4.61	3.71
Total	12.16	8.88	13.73	13.52	25.89	22.40

Existing Trails

- Trail 622
  - Maintain 1.18 miles for seasonal, non-motorized use from Gold Camp Road to the new Kineo Mountain trail.
  - Convert 0.53 miles from yearlong, non-motorized use to seasonal, motorized use from the new Kineo Mountain trail to Trail 668.
- Trail 622.A
  - Decommission the entire length (0.33 miles).
- Trail 665
  - Maintain the entire length (2.20 miles) for seasonal, motorized use.
- Trail 666
  - Maintain 1.49 miles for seasonal, non-motorized use from High Drive to the new Mount Buckhorn trail, moving the trail out of the WIZ to the extent practical.
  - Decommission 0.55 miles from the new Mount Buckhorn trail to Trail 667.
- Trail 667
  - Maintain 2.05 miles for seasonal, motorized use from High Drive to the new Kineo Mountain trail.
  - Decommission 3.71 miles from the new Kineo Mountain trail to the re-route of Trail 701.
  - Re-route a portion of Trails 667 and 701 by constructing 1.43 miles of new trail for seasonal, motorized use from Trail 667 to Trail 701.
  - Maintain 0.85 miles for seasonal, motorized use from the re-route of Trail 701 to the CSU gate.
  - Maintain 0.29 miles for seasonal, non-motorized use from the CSU gate to the proposed Lake Moraine Trail.
- Trail 668
  - Maintain 2.77 miles for seasonal, motorized use from the Frosty Park trailhead to the intersection with Trail 720, moving the trail out of the WIZ to the extent practical.
  - Decommission 0.51 miles from the intersection with Trail 720 to Trail 667.
- Trail 701

- Maintain 3.24 miles for seasonal, motorized use from the Frosty Park trailhead to the re-route of Trail 701.
- Re-route a portion of Trails 667 and 701 by constructing 1.43 miles of new trail for seasonal, motorized use from Trail 667 to Trail 701.
- Decommission 0.72 miles from the re-route of Trail 701 to Trail 667.

o Trail 720

- Maintain the entire length (1.53 miles) for seasonal, motorized use.

o Trail 720.A

- Decommission the entire length (0.28 miles).

New Trails

o Kineo Mountain Trail

- Construct 0.68 miles of new trail for seasonal, motorized use from Trail 667 to Trail 622.

o Mount Buckhorn Trail

- Construct 0.75 miles of new trail for seasonal, non-motorized use from Trail 666 to Trail 667.

Wildlife

- Reduce the density of the transportation system in the watershed.
- Develop and implement a plan to encourage beaver colonization or expansion.

NEPA Analysis Needs

Watershed and travel analysis are not part of the National Environmental Policy Act (NEPA) process. This watershed assessment is not a decision document; it provides information and focus for future NEPA analysis and can be used to inform future NEPA decisions. The recommendations in this report are subject to appropriate public involvement and environmental analysis under NEPA before travel management or other decisions are made.

Forest Plan and Regulatory Compliance

Section 212.55 of 36 CFR 212 provides criteria for designation of roads, trails, and areas:

> (a) *General criteria for designation of National Forest System roads, National Forest System trails, and areas on National Forest System lands.* In designating National Forest System roads, National Forest System trails, and areas on National Forest System lands for motor vehicle use, the responsible official shall consider effects on National Forest System natural and cultural resources, public safety, provision of recreational opportunities, access needs, conflicts among uses of National Forest System lands, the need for maintenance and administration of roads,

trails, and areas that would arise if the uses under consideration are designated; and the availability of resources for that maintenance and administration.

(b) *Specific criteria for designation of trails and areas.* In addition to the criteria in paragraph (a) of this section, in designating National Forest System trails and areas on National Forest System lands, the responsible official shall consider effects on the following, with the objective of minimizing:

(1) Damage to soil, watershed, vegetation, and other forest resources;

(2) Harassment of wildlife and significant disruption of wildlife habitats;

(3) Conflicts between motor vehicle use and existing or proposed recreational uses of National Forest System lands or neighboring Federal lands; and

(4) Conflicts among different classes of motor vehicle uses of National Forest System lands or neighboring Federal lands.

In addition, the responsible official shall consider:

(5) Compatibility of motor vehicle use with existing conditions in populated areas, taking into account sound, emissions, and other factors.

(c) *Specific criteria for designation of roads.* In addition to the criteria in paragraph (a) of this section, in designating National Forest System roads, the responsible official shall consider:

(1) Speed, volume, composition, and distribution of traffic on roads; and

(2) Compatibility of vehicle class with road geometry and road surfacing.

(d) *Rights of access.* In making designations pursuant to this subpart, the responsible official shall recognize:

(1) Valid existing rights; and

(2) The rights of use of National Forest System roads and National Forest System trails under § 212.6(b).

The recommended changes to the transportation system would meet the requirements of 36 CFR 212 by designating a system of NFS roads, trails, and areas on NFS lands for motor vehicle use. In developing the recommended transportation system, the IDT considered the potential effects on natural and cultural resources, public safety, provision of recreational opportunities, access needs, conflicts among uses of NFS lands, the need for maintenance and administration of that would arise, and the availability of resources for that maintenance and administration as required by 36 CFR 212.55(a) and documented in Appendix A and summarized in Step 4 of this watershed assessment.

As noted in Step 1 (page 5), one of the objectives of this watershed assessment was to complete the Travel Analysis process specifically considering the criteria in 36 CFR 212.55. In developing the trail portion of the recommended transportation system, the IDT considered, with the objective of minimizing adverse environmental effects, the criteria listed in 36 CFR 212.55(b). The objective of minimizing damage to soil, watershed, vegetation, and other forest resources (for example, the greenback cutthroat

trout) led directly to several recommendations in Step 5. For example, the recommendation to close 3.71 miles of Trail 667 was based on the objective of minimizing damage to soils, the Bear Creek watershed, and aquatic habitat. Construction of new or re-routed trails also considered these criteria. For example, the re-route of Trail 701 would move it farther from Bear Creek and reduce the number of streams crossings, minimizing the risk of damage to soils, the watershed, and aquatic habitat. Similarly, the reduction in trail miles, especially in the Bear Creek watershed, would minimize harassment of wildlife and significant disruption of wildlife habitats, as described in Appendix A (pages A-13 to A-16).

Most trails in the Bear Creek watershed are currently open for motorcycle use. All users have a high expectation of encountering motorcycles on these trails, as noted in Appendix A (page 30). On non-motorized trails, mountain bikers are the prevalent users and other users have a high expectation of encountering them. The recommended transportation system keeps both motorized and non-motorized trails with an objective of minimizing conflicts between motor vehicle use and other recreational uses to the extent practical.

The trails that are open to motorized use are limited to motorcycles in all cases. The recommended transportation system does not change this situation; therefore, conflicts among different classes of motor vehicle uses are not just minimized, but also essentially avoided.

Motorcycle use on trails in the Bear Creek area is a long-standing activity. This use is compatible with existing conditions on the outskirts of Colorado Springs, taking into account sound, emissions, and other factors, primarily because local residents are accustomed to this use and because development near the motorized trails is limited.

The speed, volume, composition, and distribution of traffic, as well as compatibility of vehicle class with road geometry and road surfacing were considered when developing the recommendations for High Drive. Existing information indicates no significant problems related to these factors with past use of the road; therefore, none is expected in the future, since the only changes recommended for High Drive would improve existing conditions in terms of drainage, road geometry, and other factors.

The recommended road system would maintain access in relation to valid existing rights and rights of use of NFS roads and trails under 36 CFR 212.6(b).

This watershed assessment incorporates the objectives, policies, responsibilities, and requirements of travel planning contained in FSM 7710 and FSH 7709.55, as outlined in the introductory section to this document.

Implementation of the recommended transportation system would comply with the goals, objectives, standards, and guidelines of the Forest Plan and applicable Forest Plan MAs. A Biological Assessment will be prepared and appropriate consultation will be conducted with the USFWS before any actions are implemented, ensuring compliance with the ESA. Cultural resource surveys and appropriate consultation with the SHPO would be completed before any undertakings are implemented, ensuring compliance with the NHPA.

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Table 5 Recommended Transportation System

Route Number	Route Name	Ownership	Length (miles)*	Access	Notes
Roads					
380	High Drive	City of Colorado Springs	1.64	Seasonal, motorized, all vehicles. Yearlong non-motorized.	Requires implementation of repairs of damage caused by a severe rainstorm in August 2011.
		Private	0.29		
		U. S. Forest Service	1.47		
		Road Subtotal	3.40		
		Roads Total	3.40		
Trails					
622	Seven Bridges	Colorado Springs Utilities	0.11	Seasonal, motorized	The portion of this trail recommended for motorized access is currently open only to non-motorized uses.
		U. S. Forest Service	0.42		
		Motorized Subtotal	0.53		
		U. S. Forest Service	1.18	Seasonal, non-motorized	
		Non-motorized Subtotal	1.18		
		Trail Subtotal	1.71		
622.A	Seven Bridges – North Spur	Colorado Springs Utilities	0.57	Decommissioned	
		Trail Subtotal	0.57		
665	Penrose	City of Colorado Springs	1.13	Seasonal, motorized, single track	
		U. S. Forest Service	1.07		
		Trail Subtotal	2.20		
666	Bear Creek	City of Colorado Springs	0.31	Seasonal, non-motorized	
		U. S. Forest Service	1.17		
		Non-motorized Subtotal	1.49		
		U. S. Forest Service	0.55	Decommissioned	
		Decommissioned Subtotal	0.55		
		Trail Subtotal	2.04		
667	Jones Park	Colorado Springs Utilities	0.31	Seasonal, motorized,	Also known as the “Captain Jacks” or

Table 5 Recommended Transportation System					
Route Number	**Route Name**	**Ownership**	**Length (miles)***	**Access**	**Notes**
		Private	0.07	single track	"Buckhorn" trail
		U. S. Forest Service	2.52		
		Motorized Subtotal	2.90		
		Colorado Springs Utilities	0.19	Seasonal, non-motorized	
		U. S. Forest Service	0.10		
		Non-motorized Subtotal	0.29		
		Colorado Springs Utilities	2.47	Decommissioned	
		U. S. Forest Service	1.25		
		Decommissioned Subtotal	3.71		
		Trail Subtotal	6.91		
668	Pipeline	Colorado Springs Utilities	0.31	Seasonal, motorized, single track	
		U. S. Forest Service	2.46		
		Motorized Subtotal	2.77		
		Colorado Springs Utilities	0.51	Decommissioned	
		Decommissioned Subtotal	0.51		
		Trail Subtotal	3.28		
701	Foresters	U. S. Forest Service	3.24	Seasonal, motorized, single track	
		Motorized Subtotal	3.24		
		Colorado Springs Utilities	0.51	Decommissioned	
		U. S. Forest Service	0.21		
		Decommissioned Subtotal	0.72		
		Trail Subtotal	3.97		
720	Foresters Cutoff	Colorado Springs Utilities	1.23	Seasonal, motorized, single track	
		U. S. Forest Service	0.31		
		Trail Subtotal	1.53		

Table 5 Recommended Transportation System

Route Number	Route Name	Ownership	Length (miles)*	Access	Notes
720.A	Foresters Cutoff – North Spur	Colorado Springs Utilities	0.28	Decommissioned	
		Trail Subtotal	0.28		
New	Kineo Mountain	U. S. Forest Service	0.68	Seasonal, motorized, single track	New trail construction
		Trail Subtotal	0.68		
New	Mount Buckhorn	U. S. Forest Service	0.75	Seasonal, non-motorized	New trail construction
		Trail Subtotal	0.75		
New	Trail 701 Re-route	Colorado Springs Utilities	0.98	Seasonal, motorized, single track	New trail construction
		U. S. Forest Service	0.46		
		Trail Subtotal	1.43		
		Trails Kept Open	16.14	Includes both motorized and non-motorized	
		New Trail Construction	2.86		
		Decommissioned Trails	6.35		
		Open Trails Total	19.00		
		Open Roads and Trails Total	22.40		

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Figure 4 Recommended Transportation System

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Acronyms and Abbreviations

BMP	Best Management Practice
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CMTRA	Colorado Motorized Trail Riders Association
City	City of Colorado Springs
CPW	Colorado Parks and Wildlife
CSU	Colorado Springs Utilities
EIS	Environmental Impact Statement
ESA	Endangered Species Act
Forest Plan	The Land and Resource Management Plan for the PSICC
FSH	Forest Service Handbook
FSM	Forest Service Manual
GIS	Geographic Information System
IDT	Interdisciplinary Team
MA	Management Area
MA 2A	Semi-primitive Motorized Recreation
MA 2B	Rural and Roaded Natural Recreation
MA 9A	Riparian Area Management
MA 10E	Municipal Watershed
MIS	Management Indicator Species
MSO	Mexican Spotted Owl
MVUM	Motor Vehicle Use Map
NEPA	National Environmental Policy Act
NFS	National Forest System
NFSR	National Forest System Road
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
OHV	Off-Highway Vehicle
PMJM	Preble's Meadow Jumping Mouse
PSICC	Pike and San Isabel National Forests, Cimarron and Comanche National Grasslands
RMFI	Rocky Mountain Field Institute

RMO	Road Management Objective
ROD	Record of Decision
RTP	Ring the Peak
SHPO	State Historic Preservation Officer
USFS	U. S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U. S. Geological Survey
WIZ	Water Influence Zone

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Appendix A FS-643 Questions and Answers

This appendix provides detailed answers to each question in FS-643, except that several changes were made to the questions. First, recommendations from the R2 supplement to FS-643 were incorporated. Then, the wording was changed because travel analysis examines motorized travel routes, not just roads. In addition, the current analysis will consider non-motorized trails. For example, "road system" was changed to "transportation system" and "roads" was changed to "roads and trails." Finally, "roaded" was changed to "motorized" and "unroaded" was changed to "non-motorized." This change was made because the question of roaded vs. unroaded areas has been settled by the Colorado Roadless Rule. In the context of the current project, motorized vs. non-motorized use (or no use at all) of roads and trails is the relevant question. The answers discussed below have been summarized into Step 4 of this watershed assessment. The order of the questions and answers is not meant to reflect importance or value, but follows the organization of FS-643.

Aquatic, Riparian Zone, and Water Quality (AQ)

AQ1: How and where does the transportation system modify the surface and subsurface hydrology of the area?

The existing condition of the Bear Creek watershed is a function of natural and anthropogenic processes. The watershed is most influenced by a road and trails network with heavy recreational use. Cumulative effects from mining, wildfire, and watershed restoration activities also exist on the landscape. Studies conducted by the USFS in the mid-1990s indicate that High Drive and the trail system may be significant contributors of sediment to Bear Creek (Winters et al. 1994).

In 2011, the PSICC completed watershed condition class ratings using the 2010 Forest Service Watershed Condition Classification Technical Guide. Watershed condition classification is the process of describing watershed condition in terms of discrete classes that reflect the level of watershed health or integrity. Bear Creek rated out as a Watershed Condition Class II, which means the watershed exhibits moderate geomorphic, hydrologic, and biotic integrity relative to its natural potential condition.

RMFI, which has been involved in fish habitat and erosion control work in Bear Creek since 2009, prepared an assessment of the trails in the Bear Creek watershed (RMFI 2012). In general, the report noted that much of the trail system is poorly located, has non-functioning or poorly functioning trail drainage, and has not been adequately repaired or maintained over time. RMFI (2012) has identified many locations where additional structures could assist with prevention of down cutting and concentration of storm flows and sediment.

CH2M Hill (2013) completed an assessment for High Drive that investigates the existing drainage system, including the bridges, culverts, runouts, and other related features. According to the report, "much of the system is currently not functional due to accumulated sediment." The road surface, as well as cut and fill slopes are composed of unvegetated and highly erosive decomposed granite. Some drainage structures such as ditches and culverts are filled with sediment and not functioning. Concentrated storm flows are eroding road surfaces, ditches, fill slopes, and the surrounding hill slopes, creating gullies and transporting sediment into Bear Creek and its tributaries.

An automated stream gauge is maintained by the U. S. Geological Survey (USGS) on Bear Creek downstream of the analysis area. Flow measurements taken during the Fin-Up survey (Gallagher 2011) indicate that typical low flow conditions are approximately 0.4 cubic feet per second (cfs) in the study reaches. Bank-full stage in the study reaches was estimated to be 16 to 20 cfs (Gallagher 2011). The regional curve for bankfull discharge as a function of drainage area indicates a bankfull flow of about 20 cfs. Although the Fin-Up report (Gallagher 2011) makes note of a CSU water diversion, CSU has confirmed that no water has been diverted since the early 1990s and that the hydrograph represents natural stream flows. According to the USGS gauge, a bankfull event has not occurred in the drainage since 1999 when the peak discharge reached 185 cfs. In Bear Creek, the small size of the stream makes it vulnerable to declines in summer discharge, as low flows reduce the total amount of habitat available for aquatic organisms during the critical summer period. Summer flows in 2011 and 2012 were the third and fourth lowest on record (since 1992).

Transportation systems can alter the surface and subsurface hydrology of an area by intercepting, concentrating, and diverting flows from their natural flow paths (Wemple et al 1996). Typically, intercepted ground and surface water is routed more quickly to stream channels through a ditch system. This process is most prevalent in valley bottom and mid-slope roads on north-facing slopes and contributes to alteration in the timing of storm runoff, the duration of storm flow, and the magnitude of peak flows. Suspended sediment in streams may increase because of larger peak flows, which increase overland flow or mobilize in-channel and bed load sources.

The WIZ and stream crossings are of particular concern when considering the effects of roads and trails because this is generally where the transportation system is directly connected with the stream channel. The WIZ includes the geomorphic floodplain (valley bottom), riparian ecosystem, and inner gorge of perennial and intermittent streams. Its minimum horizontal width (from top of each bank) is the greater of 100 feet or the mean height of mature dominant late-seral vegetation. In the analysis area, the WIZ is generally set at 100 feet since the mature dominant late-seral vegetation does not reach this height. The WIZ protects interacting aquatic, riparian, and upland functions by maintaining natural processes and resilience of soil, water, and vegetation systems (USFS 2006). The analysis area contains an estimated 277 acres of WIZ, which represents 7 percent of the area. As shown in Table A1, about 32 percent of the system road and trails in the Bear Creek watershed are located in the WIZ indicating the transportation system is concentrated along streams and poses a high risk of sediment transport.

The recommended transportation system would reduce the length of roads and trails in the watershed by 27%, but more importantly would reduce the length of roads and trails in the WIZ by 70% (Tables A1 and A2), reducing the risk to aquatic and riparian systems.

Table A1 The Existing Transportation System and the 100 ft. WIZ

Route	Total Length* (feet)	Length in Bear Creek WIZ* (feet)	Length in Other WIZ* (feet)	Total Length in WIZ* (feet)
380	11,588	3,398	0	3,398
665	5,513	0	0	0
666	10,756	4,870	0	4,870
667	21,933	10,267	222	10,489
668	758	220	0	220
701	6,685	93	220	313
720	3,531	0	0	0
720.A	2,622	167	693	860
Total	63,386	19,015	1,135	20,150

* In the Bear Creek watershed

Table A2 The Recommended Transportation System and the 100 ft. WIZ

Route	Total Length* (feet)	Length in Bear Creek WIZ*	Length in Other WIZ* (feet)	Length in WIZ* (feet)
380	11,588	3,398	0	3,398
665	5,513	0	0	0
666	7,858	2,211	0	2,211
667	3,738	0	0	0
668	0	0	0	0
701[+]	9,219	0	0	0
720	4,972	0	0	0
720.A	0	0	0	0
Mount Buckhorn (new)	3,637	0	359	359
Total	46,525	5,609	359	5,968

* In the Bear Creek watershed
[+] Includes re-route

AQ2: How and where does the transportation system generate surface erosion?

Soil erosion is a function of a number of soil and environmental factors that affect soil particle detachment and movement down slope. Soil factors include inherent soil erodibility (K-factor) in combination with length of slope and steepness of slope. Environmental factors include surface vegetative cover and rainfall intensity. Generally, erosion increases with increased soil erodibility, rainfall intensity, lower amounts of surface cover, steeper slopes, and longer slope

lengths. Water erosion is the principal form of erosion considered in this assessment, although wind erosion may be significant on areas where vegetation cover is sparse.

Each soil map unit in the analysis area was given a soil erosion hazard rating, which indicates its susceptibility to erosion. Forest Soil Scientist Ken Kanaan developed the ratings using the local Natural Resource Conservation Service (NRCS) soil survey (NRCS 1994). The rating is based on the K factor and the average slope of that map unit. Table A3 indicates that almost the entire area (97 percent) has a high soil erosion hazard, which is not surprising considering the steep slopes (see Table A5) and high K factor for soils derived from the Pikes Peak granite. For these soils, particles are readily moved by overland flow after disturbance. These soils may require considerable expense to control erosion and sedimentation as a part of BMPs when activities are planned for such areas.

Table A3 Soil Erosion Hazard

Category	Acres
Low	49
Moderate	72
High	3,480
Total	3,602

In relation to roads and trails, surface erosion can occur because their surfaces, cut slopes, fill slopes, and associated drainage structures are usually composed of erodible material (Bilby et al 1989). Rates of erosion vary greatly depending on the slope, soil porosity, and the erosive characteristics of the exposed surfaces, as well as on the quantity and energy of accumulated storm flows. The energy of these storm flows is strongly influenced by topography, geology, and local surface soil conditions such as porosity, organic litter levels, and vegetative cover.

Flows of increased magnitude are capable of detaching and moving sediment from road surfaces into stream channels, especially those comprised of fine-grained, native materials. Roads with coarse-grained, graveled surfaces are less likely to contribute sediment to storm flows, although their associated ditch systems can provide a source of sediment during storm flow events. Roads and trails located in the channel bottom or having hydrologic connectivity with the stream are of greatest concern when considering surface erosion sources and mechanisms.

The Bear Creek watershed has approximately 2.2 miles of system roads and 9.8 miles of system trails. This is a density of about 2.13 miles per square mile. Field reconnaissance determined that many cut and fill slopes are steep and lack the vegetation necessary to prevent rilling and gullying. Accounting for differences in widths of the surface, as well as cut and fill slopes; this translates into about 62 acres of bare ground (Table A4). In addition to system roads and trails, there are about 29.3 miles of non-system (unauthorized) trails. These trails have not been surveyed in detail, but if we assume the average width of bare ground associated with each trail is four feet, this represents an additional 14 acres of disturbance. The PSICC GIS data show 113 acres of barren ground in the analysis area. This area most likely represents a combination of rock outcrops and barren talus slopes, but little overlap with bare ground on roads and trails.

Recent restoration efforts have benefited soil, water, and aquatic resources at highly disturbed sites near Trails 666 and 667. RMFI hand crews, user groups, and other volunteers implemented several erosion control measures. Monitoring has revealed that restoration strategies have been successful, but require a substantial commitment to maintenance. Additional monitoring should be implemented to provide for an adaptive management approach.

The recommended transportation system would reduce the extent of disturbed ground attributable to roads and trails. Total disturbance from the transportation system would be reduced by about 18 percent. More importantly, the extent of disturbance in the WIZ would be reduced by 61 percent (Table A4). This would reduce surface erosion and sediment delivery to Bear Creek once the trails identified for closure are effectively rehabilitated.

Table A4 Ground Disturbance Caused by the Transportation System*

System	Total Disturbance (acres)	Disturbance in WIZ (acres)	Disturbance in WIZ (percent)
Existing	61.8	17.9	29%
Recommended	50.8	7.0	14%

*This table will be updated to reflect the changes in table A1 and A2, which separate Bear Creek WIZ from other WIZ.

AQ3: How and where does the transportation system affect mass wasting?

Mass wasting is a broad term that can apply to a variety of conditions and processes. Movements that displace bedrock include landslides and slumps, which may be triggered by earth tremors and quakes, active fault movement, or over-saturation of geologic strata by water. Debris, earth, and mudflows are caused by surface runoff accumulating soil and debris such as rocks and trees and moving down slope with considerable force. These are generally confined to the upper several feet of earth surface. Mass movements, whether natural or human-caused, are undesirable because of the adverse effects on soil productivity and water quality.

Mass wasting is influenced by a number of factors, including hill slope gradient, slope position, soil type, bedrock geology, geologic structure, type of road construction, road drainage, and groundwater characteristics. Mass wasting events such as debris torrents and debris flows often severely affect roadbed fills at stream crossings by transporting large amounts of sediment to higher-order channels. The presence of roads across steep slopes can increase the risk of mass wasting caused by the damming effect of the roadbed on subsurface flows. Table A5 shows the range of slopes present in the analysis area. Note that about 80 percent of the slopes exceed 30 percent, the gradient above which mass wasting begins to become a concern.

Table A5 Slope

Slope (percent)	Acres
0 to 10	76
10 to 20	269
20 to 30	364
Greater than 30	2,895

Mass movement potential is a rating of the possibility of mass movements occurring in a soil map unit. This possibility is directly translated to a risk to use and management. For example, the higher the mass movement potential rating, the higher the probability of mass failure and the higher the risk for activities planned in such areas. Map units in the analysis area have low mass movement potential (NRCS 1994) because they are located on consolidated geologic materials such as gneiss, schist, granite, and sandstone. These geologic materials generally occur on gently sloping to moderately steep landforms. Photo interpretation and field observations showed no evidence of recent or previous landslides or other mass movements. There is little risk of mass movement and minimal potential for damage to watersheds caused by mass wasting. The recommended transportation system is not expected to change the risk of mass movement or associated watershed damage.

AQ4: How and where do road- or trail-stream crossings influence local stream channels and water quality?

Sediment is the primary variable of concern with regard to water quality in Bear Creek. Sources of sediment include roads, trails, mining activities, illegal trail use, natural hill slope erosion, wildfires, channel processes, and other natural sediment sources. Erosion and sedimentation occur during precipitation and runoff events as well as during base stream flow. Altered flow regimes, hill slope disturbance, and channel disturbance lead to accelerated bank and streambed erosion.

Road and trail crossings of stream channels can contribute large quantities of sediment to a stream, which in turn impairs water quality. Structures such as culverts and bridges can substantially reduce sediment input at crossings; however, crossings with culverts are also potential inputs of sediment to streams, either when the hydraulic capacity of the culvert is exceeded or when the culvert becomes plugged and the stream flows over the fill. Erosion of the fill or diversion of stream flow onto the road surface or inboard ditch can drastically alter channel morphology downstream and create a sediment load that exceeds the bed load capabilities of the channel.

The number of stream crossings by travel route is shown in Table A6. At many of these crossings, the stream channel is over-widened and the stream banks have a very high erosion rate. Along Trail 667, most perennial crossings (12 of 13) have been upgraded with bridges to reduce sediment input.

Table A6 Stream Crossings – Existing Transportation System

Route Number	Stream Type Crossed			
	Ephemeral	Intermittent	Perennial	Total
380	5	0	4	9
665	3	0	0	3
666	1	1	3	5
667	6	4	13	23
668	0	0	1	1
701	2	1	0	3
720	1	0	0	1
720.A	0	1	1	2
Total	18	7	22	47

CH2M Hill (2013) completed an assessment for High Drive that investigates the existing drainage system, including the bridges, culverts, runouts, and other related features. According to the report, "much of the system is currently not functional due to accumulated sediment." The road surface, as well as cut and fill slopes are composed of unvegetated and highly erosive decomposed granite. Some drainage structures such as ditches and culverts are filled with sediment and not functioning, causing concentrated flows that are eroding road surfaces, ditches, fill slopes, and the surrounding hill slopes, creating gullies and transporting sediment into Bear Creek and its tributaries.

The recommended transportation system would reduce the number of stream crossing from 47 to 22, including a reduction in the number of perennial crossings from 22 to six (Table A7). Reducing the number of stream crossings would reduce the risk of adverse watershed effects from road or trail crossings.

Table A7 Stream Crossings – Recommended Transportation System

Route Number	Stream Type Crossed			
	Ephemeral	Intermittent	Perennial	Total
380	5	0	4	9
665	3	0	0	3
666	1	1	2	4
667	1	0	0	1
668	0	0	0	0
701[+]	3	1	0	4
720	1	0	0	1
720.A	0	0	0	0
Mount Buckhorn (new)	0	0	0	0
Total	14	2	6	22

[+] Includes re-route

AQ5: How and where does the transportation system create potential for pollutants, such as chemical spills, oils, de-icing salts, herbicides, or road sand to enter surface waters?

Roads and trails have the potential to cause pollutants to enter streams in several ways. Chemicals such as surfacing oils, magnesium chloride, de-icing salts, herbicides, and fertilizers may be applied to roads for maintenance, safety, or other improvement. High Drive is currently closed during the winter and this risk is low. Vehicle contaminants such as oils, brake-pad linings, and hydraulic fluid, as well as accidental spills, may also contaminate surface waters from any of the roads or trails. This risk is most acute where the travel route is located in the WIZ (Table A1) and at stream crossings (Tables A6 and A7). The recommended transportation system would reduce the number of stream crossings and length of transportation system in the WIZ (Tables A2 and A7), thereby reducing the risk of pollutants entering surface waters.

AQ6: How and where is the transportation system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity (such as delivery of sediments, thermal increases, elevated peak flows)?

Hydrologic connectivity between the transportation system and streams occurs where roads or trails intercept and collect runoff and convey it into established stream channels. Wherever a hydrologic connection exists, rapid runoff, sediment, and road-associated chemicals generated in the road prism are delivered to the stream channel. Roads and trails, particularly High Drive and Trails 666 and 667, are hydrologically connected to Bear Creek wherever they located in the WIZ and at stream crossings. Table A1 describes in detail the extent hydrologic connectivity of the routes. The recommended transportation system would reduce the number of stream crossings and length of transportation system in the WIZ (Tables A2 and A7), thereby reducing hydrologic connectivity.

AQ7: What downstream beneficial uses of water exist in the area? What changes in uses and demand are expected over time? How are they affected or put at risk by road- or trail-derived pollutants? WP2: How does transportation system development and use affect water quality in municipal watersheds? Are there any streams in the area listed in the State 303(d) list or 305(b) report as impaired due to road- or trail-derived pollutants such as sediment?

The downstream beneficial use of Bear Creek is designated by the Colorado Department of Public Health and Environment (CDPHE) as Aquatic Life (Coldwater), Recreation 1A, Water Supply, and Agriculture (CDPHE 2006). The narrative sediment standards state, "Surface waters shall be free from substances attributable to human caused point source or nonpoint source discharge in amounts, concentrations, or combinations, which can settle to form bottom deposits detrimental to the beneficial uses. Depositions are stream bottom build-up of materials, which include but are not limited to anaerobic sludges, mine slurry or tailings, silt, or mud" and "are harmful to the beneficial uses." Bear Creek is not a 303(d) listed stream (CDPHE 2010).

Sediment is the primary variable of concern for water quality in Bear Creek. Sources of sediment include roads, trails, mining activities, illegal trail use, natural hill slope erosion, wildfires, channel processes, and other natural sediment sources. Erosion and sedimentation occur during precipitation and runoff events as well as during base stream flow. Altered flow regimes, hill-slope disturbance, and channel disturbance leads to accelerated bank and streambed erosion. Road and trail derived pollutants can adversely affect aquatic habitat and species, as well as water quality in this municipal watershed.

The recommended transportation system would not change the downstream beneficial uses of water. Any changes in demand for water would likely be related to habitat improvement for the greenback cutthroat trout and not to use of the stream as a public water supply. One possible change in use would be if CSU decided to begin withdrawing water from Bear Creek for municipal use.

AQ8: How and where does the transportation system affect wetlands?

Wetlands exist in the upper portion of the watershed in association with the beaver ponds upstream of Jones Park. Fringe wetlands can also be found along the edges of the channel where lower stream gradients exist and saturated soils support wetland plant species. Wetlands have many functions including storing and filtering water, as well as providing fish and wildlife habitat, plant diversity, groundwater recharge, and the transformation of nutrients.

The transportation system affects wetlands principally at stream crossings. Stream banks, which generally support wetland vegetation, often do not have any vegetation at these crossings because they have been physically damaged by recreational activity or buried by sediment. Wetlands can also be affected at sites where sediment from a trail or road enters the stream, burying or scouring bank vegetation. Recreational use along the edges of the stream has also denuded the banks, some of which may have been wetlands. Lastly, sediment deposition is evident in the beaver ponds and this has likely altered the hydrology of the site and affected wetland function and distribution.

Wetlands have likely been affected over the years along High Drive and Trails 666 and 667; at the stream crossings associated with High Drive and Trails 666, 667, 668, 701, and 720A; and along the social trails found along Bear Creek from the caretaker's house in Bear Creek Park to Josephine Falls.

The recommended transportation system would reduce the number of stream crossings and miles of social trails and potentially improve conditions for wetland function. If these crossing sites and social trails can be successfully restored, sediment contributions would be reduced and vegetative cover and function may re-establish. The recommended changes would also reduce the length of the transportation system in the WIZ (Tables A2 and A7). Over time, this would reduce the amount of sediment entering the beaver ponds complex and improve wetland function at this site.

AQ9: How does the transportation system alter physical channel dynamics, including isolation of floodplains; constraints on channel migration; and the movement of large wood, fine organic matter, and sediment?

Stream systems are dynamic and tend to migrate within historic floodplains as they carry and re-deposit bed load materials. Streams also transport and deposit large pieces of woody debris and finer organic matter that provide physical structure and diverse aquatic habitat. Transportation route alignments and fill slopes can isolate floodplains, increase flow energy by constricting the channel, constrain channel migration, and reduce riparian and aquatic habitat. Encroachment on stream channels can also divert stream flows to the opposite bank from their natural position, creating a cut bank that destabilizes the hill slope and increases sediment input to the channel. Wood and sediment trapped behind stream crossings can limit the downstream transport of this material and increase the risk of a crossing failure. The risk of the transportation system altering channel dynamics increases with its proximity to Bear Creek, especially where roads or trails are in the WIZ. Tables A1 and A4 describe the extent of transportation system disturbance in the WIZ. The recommended transportation system would reduce the number of stream crossings and length of transportation system in the WIZ (Tables A2 and A7); therefore, the risk of altered channel dynamics in Bear Creek would be reduced.

AQ10: How and where does the transportation system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what extent?

The transportation system does not obviously restrict the movement of aquatic organisms, such as fish or stream insects, with a few exceptions. There are seven bridge crossings on Bear Creek: these do not restrict aquatic organism passage. High Drive crosses Bear Creek four times; each of these crossings occurs at grade through grouted rock bridges that have been in place for many years. Upstream movement of trout through one of the smaller bridge openings at creek crossing #4 (CH2M Hill 2013) may be restricted in high stream flow events. There are three stream fords on Trail 666. At each of these sites, the channel is over-widened and the water is shallow. In low flow periods, shallow water could restrict the movement of fish. The recommended transportation

system would improve passage restrictions by narrowing the cross-sectional area at the stream fords and increasing stream depth.

AQ11: How does the transportation system affect shading, litter fall, and riparian plant communities?

Riparian vegetation is important because it helps maintain stream channel profiles by protecting banks with soil-binding roots and shielding banks from erosion. It provides cover, controls temperature, provides large woody material for recruitment, and provides nutrients for aquatic and terrestrial fish food organisms. The loss of riparian vegetation directly and indirectly affects the productivity of the stream. Although riparian areas make up a low proportion of the vegetative cover, they have high value to wildlife as well.

The transportation system has caused the loss of approximately three acres of riparian vegetation. At each of the stream crossings in the trail system (Table A6), riparian vegetation has been lost. The High Drive road prism has displaced riparian vegetation, especially in those sections where the road is immediately adjacent to the stream. Sediment cast from the road surface during maintenance operations and eroded during storm events buries riparian vegetation and scours ground cover.

High Drive also provides easy access to the stream for recreationists. Repeated use of certain sites and routes has denuded stream banks and the short hill slopes between the road and the stream. Social trails along Bear Creek are common in the lower portion of the watershed, from Josephine Falls down to the caretaker's house in Bear Creek Park. These trails provide a direct conduit to the stream for eroded soils when they are located on steep grades or where water is concentrated.

Blankets of fugitive dust raised by recreational traffic can also disrupt photosynthetic processes, thereby suppressing plant growth and vigor of nearby riparian vegetation. This is more likely to occur along High Drive and on the motorized trail system than on the non-motorized trails.

The recommended actions would increase riparian vegetation on Bear Creek at each of the eliminated stream crossings and along narrowed portions of the High Drive road prism. This would not provide a substantial increase in the amount of riparian vegetation in the watershed but would provide very localized site improvements.

AQ12: How and where does the transportation system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?

The transportation system provides relatively easy access to Bear Creek year-round. High Drive is open to motorized use for approximately six months of the year, but receives a high level of non-motorized use all year because of its proximity to Colorado Springs. It is possible that the transportation system facilitates some illegal fishing. A small number of people illegally use the area for camping even though overnight use is prohibited on both City and NFS lands. Recently, all known campsites in the area where closed and rehabilitated. It is common to find small rock dams and other in-stream modifications because of the high level of recreational use along Bear Creek. These modifications often lead to over-widening of the stream channel and direct disturbance of fish and spawning areas. There is also evidence that high sediment contributions are decreasing pool volume, directly reducing habitat for the greenback cutthroat trout (Gallagher 2011). Disturbances indirectly related to climate change, like extreme droughts and wildfire, heighten the vulnerability of this population of greenback cutthroat trout.

The recommended changes to the transportation system are not likely to reduce the risk to the population from illegal fishing. Additional law enforcement would be needed to further reduce what we believe is now an infrequent occurrence. The recommended transportation system would reduce surface erosion and sediment delivery to Bear Creek once the modifications to High Drive and the trail system are effectively implemented. Over time, this would reduce the direct adverse effects of sediment on fish habitat.

AQ13: How and where does the transportation system facilitate the introduction of non-native aquatic species?

Aquatic nuisance species are non-native plants, animals, and pathogens that can exist in lakes, streams, rivers, and wetlands. Colorado has several aquatic nuisance species. These include animals such as the New Zealand mudsnails (*Potamopyrgus antipodarum*); pathogens such as those that cause whirling disease (*Myxobolus cerebralis)*; and plants such as Eurasian water milfoil (*Myriophyllum spicatum*) and didymo (*Didymospenia geminata*). These species can disrupt the diversity or abundance of native species, affect the ecological stability of infested waters, and cause major economic losses. The introduction of invasive species is considered a primary threat to our native ecosystems, second only to direct habitat loss.

Bear Creek does not have any aquatic nuisance species. The introduction of a non-native aquatic species into Bear Creek could have a devastating effect on the cutthroat population. The actual risk of recreationists using the transportation system accidently introducing invasive or disease-causing organisms into Bear Creek is unknown. With unknown risks, it is extremely important to take precautions for preventing disease, particularly when protecting rare species. By substantially reducing the number of stream crossings and reducing water contact, the recommended transportation system would decrease the risk of accidently introducing aquatic invasive species into the system.

AQ14: To what extent does the transportation system overlap with areas of exceptionally high aquatic diversity or productivity or areas containing rare or unique aquatic species or species of interest?

The entire Bear Creek watershed is considered an area of exceptionally high importance for aquatic species because of the presence of the greenback cutthroat trout. The transportation system under consideration in this analysis overlaps in large part with the Bear Creek watershed.

The greenback cutthroat trout, Colorado's state fish, is native to the east side of Continental Divide in Colorado. Historically, it was thought to have occupied the Arkansas and South Platte River watersheds; however, recent genetic analysis indicates it occurred only in the South Platte River watershed (Metcalf et al. 2012). Beginning in the middle of the 19th century, native trout were extirpated from many streams on the Colorado Front Range by overfishing, pollution from mining, and agricultural practices (Metcalf et al. 2012). At the same time, native and non-native trout were transplanted and stocked widely across Colorado, a practice that led to further loss of native cutthroat trout populations through competition and hybridization.

Extensive surveys have failed to identify any extant populations of the greenback cutthroat trout in the South Platte watershed. At present, the sole known remaining population of genetically pure greenback cutthroat trout inhabits Bear Creek, a tributary of Fountain Creek, itself a tributary of the Arkansas River (Metcalf et al. 2012). This population is believed to be a remnant of fish stocked into the originally fishless Bear Creek by a settler in the late 19th century (Metcalf et al. 2012). Metcalf and others (2012) note that the population harbors little genetic variation, probably because of the small number of founding fish or a subsequent population bottleneck.

The greenback cutthroat trout is currently listed as threatened under the ESA. Based on the new findings on the genetics of the trout, the U. S. Fish and Wildlife Service (USFWS) will reevaluate the taxonomy and status of the species to determine whether adjustments to its status and current protections are warranted. Greenback cutthroat trout are also considered an aquatic Management Indicator Species (MIS) for the PSICC. The Forest Plan directs us to manage and provide habitat for the recovery of endangered and threatened species.

The population occupies about 4.1 miles of Bear Creek of which 3.4 miles are considered fully occupied and the remaining stream is considered transitional habitat. No other fish species are present in the watershed. Natural barriers in Bear Creek have allowed the trout to exist here but also limit dispersal. A long, steep cascade located ¼ mile upstream of the caretaker's house along High Drive prevents upstream movement of non-native brook trout that exist in lower Bear Creek. Josephine Falls is a barrier in the middle reach of the stream that prevents movement from the lower portion of the occupied range to the upper portion. Low flows limit the suitability of habitat in the transitional section of habitat upstream of Jones Park.

Colorado Parks and Wildlife (CPW) surveyed Bear Creek in 2008 and 2011. CPW found that all age classes were well represented, indicating that reproduction and recruitment have been occurring. CPW estimates that there are approximately 750 adult greenbacks in Bear Creek and considers this population (biomass and density) to be within the normal range for cutthroat streams in Colorado (D. Krieger, personal communication, 2012).

Optimal habitat for cutthroat trout consists of clear, cold water, with silt-free rocky substrate in riffle-run areas. Deep pools, riparian vegetation, in-stream cover and stable water flows and temperature regimes all play important roles as well. Conversely, fine sediments can be harmful to fish and other aquatic organisms as they may smother fish eggs and fill spaces between substrates where aquatic insects live.

Stream habitats are dynamic and respond to processes recurring at daily, seasonal, annual, and longer intervals, and episodic events such as tree fall and fires. In-stream habitat surveys were conducted in 1994 and 2011. It is important to note that the 1994 survey was conducted following a bankfull event. A bankfull event has not occurred in Bear Creek since 1999, twelve years prior to the 2011 survey.

Pools, riffles, and glides are the three main habitat features in Bear Creek. The glides are shallow, gravel-filled features that do not have deep water like pools, and do not have insect production typically found in riffles. In comparing the survey results, many of the habitat features in Bear Creek had declined by 2011 compared with 1994, while others remained constant or improved. Most notably, pool area, maximum pool depth, and average pool depth declined significantly. Glide habitat increased significantly because of sediment aggradation. Each of these changed conditions reflects the lack of sufficient stream velocities to scour and transport the quantity of sediment in the channel and retain pool area and depth. The amount of large woody material had increased by 2011, which can lead to increased pool formation and cover over time. The extent of eroding stream bank remained stable. Cover, which in part reflects the availability of water at least ½ foot in depth, declined in each reach.

In 2012, South Ruxton Creek was identified as a reference stream for Bear Creek. South Ruxton Creek is located immediately west of the headwaters of Bear Creek and flows north to Big Tooth Reservoir. It has the same geology and stream gradient as Bear Creek and is subject to similar hydrologic events. In contrast, South Ruxton Creek does not have a substantial road or trail system in its watershed, with the exception of one trail that traverses the upper portion of the

watershed and has one stream crossing. Both streams have experienced similar flow events, with the last bankfull event occurring in 1997 in South Ruxton Creek. Maximum pool depth and average pool depth are significantly greater in South Ruxton Creek in 2012 than in Bear Creek in 2011. Glides are rare in South Ruxton Creek. It is apparent that South Ruxton Creek does not carry the same sediment load as Bear Creek. If the current habitat conditions in Bear Creek were solely a reflection of low flows since 1999, one would expect similar habitat conditions in both streams. That is not the case; sediment does not dominate South Ruxton Creek as it does Bear Creek.

As described above, the recommended transportation system would reduce the number of stream crossings, the length of trails, and overall area of disturbance in the WIZ (Tables A1, A2, A4, and A7). When effectively implemented, these changes are expected to reduce the amount of surface erosion and sediment delivery to Bear Creek. Sediment contributions from the existing road and trail system have been additive to natural hill slope erosion contributions for many decades. As evidenced in the reference stream, the habitat conditions in Bear Creek are a reflection of both high sediment contributions and low flow conditions. The recommended changes to the transportation system would substantially reduce on-going sediment delivery to Bear Creek. In-stream habitat restoration work would be needed to remove accumulated sediment. Over time, these improvements would increase the resiliency of the population and its ability to withstand changing climate conditions, such as extreme drought.

Terrestrial Wildlife (TW)

TW1: What are the direct and indirect effects of the transportation system on terrestrial species habitat?

The diverse vegetation types in the watershed provide habitat for an assortment of wildlife. Common mammals include black bear, cougar, bobcat, mule deer, pine squirrel, golden-mantled ground squirrel, bushy-tailed wood rat, mountain cottontail, porcupine, red fox, striped skunk, and raccoon. A variety of bat species may inhabit the area, including fringed myotis, hoary bat, little brown myotis, western long-eared myotis, long-legged myotis, and silver-haired bat. Bird species that use the area include mountain chickadee, white-breasted nuthatch, northern flicker, hairy woodpecker, gray jay, Stellar's jay, olive-sided flycatcher, American robin, dark-eyed junco, common raven, pine siskin, western wood pewee, yellow-rumped warbler, Clark's nutcracker, and Townsend's solitaire. Raptors that occur in the forested habitats include the flammulated owl, northern saw-whet owl, great horned owl, northern goshawk, and Cooper's hawk. Raptors associated with rock outcrops include the golden eagle and peregrine falcon.

One species of particular importance is the North American beaver, which generally inhabits wide valleys containing low gradient streams with at least intermittent flow, or lakes and ponds with standing water (Baker and Hill 2003, Boyle and Owens 2007). A series of four beaver ponds that encompass about 0.3 acres are located along Bear Creek in a relatively confined meadow in the upper, northwestern portion of the watershed. This meadow is about six acres is size and contains small patches of willow with scattered spruce and aspen. Components of beaver habitat in this area include a low gradient stream and suitable vegetation. In particular, the site contains willow and aspen, which provide bark for feeding. The stream at this location has a low gradient, which is conducive to water impoundment, but its depth and width may be inadequate to provide protection from predators or access to the stream bank for foraging. The risk of these ponds being damaged by flooding is low as the contributing watershed to these features is merely 237 acres. However, the habitat suitability of these features for beaver may be susceptible to fluctuations in stream flow caused by the limited size of this catchment area. Habitat conditions and topography

along the remainder of Bear Creek limit more widespread beaver use. A high stream gradient, relatively confined drainage that is absent of floodplains or in which floodplain width is constricted and sparse woody vegetation limit suitability for beavers.

Various recreational activities have degraded habitat or caused habitat loss and fragmentation in the watershed. These activities have also modified important features of wildlife habitat, such as food supply and availability, shelter, and living space. Altered habitat may induce changes in species behavior, as well as influence survival, reproduction, and distribution (Cole and Landres 1995). Human presence and noise associated with recreation may also cause a species to respond to the disturbance through avoidance of the specific activity. This may occur in the form of a defense response that is active (for example, fight or flight) or passive (for example, inhibition of activity). Avoidance of recreational activities may effectively reduce the amount of habitat available to wildlife species. Repeated displacement of species during feeding and resting periods may also cause increased energy expenditures through these avoidance behaviors. In addition, wildlife species that are perceived as habituated to recreation-related disturbances may endure subtle physiological responses, such as chronically elevated heart rates and changes in alertness and posture (Youmans 1999). Elevated heart rates, energy expended in response to disturbance, and reductions of energy input through disturbance may increase energy expenditures or decrease energy acquisition. These factors may cause increased sickness, disease, and the potential death of individuals (Hickman et al. 1999).

Roads and trails affect the availability and quality of habitat for wildlife species through the degradation or loss of vegetation, fragmentation, and increased sedimentation or erosion. Existing roads and trails decrease the amount of suitable habitat available to wildlife species. As noted in the answer to question AQ2, about 62 acres of habitat have been lost to roads and trails. The transportation system also affects habitat suitability. Habitat conditions adjacent to travel routes are generally degraded by the use of these features for recreation. Habitat may also be used by species to a lesser extent than available because of human presence. A reduction in habitat effectiveness adjacent to travel routes essentially reduces habitat availability. Travel routes also disrupt habitat connectivity and may impede population dispersal.

Roads and trails contribute to habitat fragmentation by dividing landscapes and converting interior habitat into edge habitat. Travel routes can also function as barriers or obstacles that restrict daily, seasonal, or dispersal movements. Road and trail density is 0.39 and 1.75 miles per square mile, respectively. These features may reduce the amount of habitat available to wildlife by causing species to shift the location of home ranges to areas of lower road or trail densities (Claar et al. 1999).

The effect of soil erosion and associated sedimentation on wildlife habitat is intensified in or adjacent to riparian areas. These systems are limited in extent, but are critical to the species dependent on these habitats, such as the American beaver and the federally listed Preble's meadow jumping mouse. Riparian areas have been degraded by the use and proximity of the trail system and High Drive to Bear Creek. The inundation or loss of riparian vegetation from these sediment sources reduces the habitat available to riparian dependent species. High Drive in particular is a major source of sediment because of road placement, vehicle volume, and inadequate drainage structures. For example, as recently as August of 2012, this feature experienced a rain event that caused excessive erosion and sediment transport into Bear Creek.

The reduction in the density associated with the recommended transportation system would increase the amount, availability, and quality of wildlife habitat. The density of travel routes would be reduced from 2.1 to 1.5 miles per square mile. In particular, trail density would be

reduced from 1.75 to 1.15 miles per square mile, with motorized trails decreasing from 1.38 to 0.76 miles per square mile. Road density would remain unchanged at 0.39 miles per square mile, but would remain concentrated in the eastern quarter of the watershed. Reduced trail density would improve habitat suitability and minimize the effects of fragmentation. Habitat connectivity would improve for species daily, seasonal, and dispersal movements. Trail decommissioning would also minimize the establishment and proliferation of non-system trails that cause additional habitat loss or degradation.

TW2: How does the transportation system facilitate human activities that affect habitat?

The transportation system facilitates human entry into portions of the watershed that are generally less accessible for recreational activities. According to Weaver and Dale (1978), hikers apply less pressure, and therefore have less effect on vegetation than either horses or motorcycles. However, effects to wildlife habitat that can be attributed to hiker use include the establishment and proliferation of non-system trails. Repeated hiking on non-system trails has caused vegetation disturbance and soil displacement that increase habitat loss and fragmentation.

Travel routes also provide access to unique or sensitive habitats. For example, a combined route of High Drive, Trail 666, and several non-system trails can be used by humans to access the rock outcrops of Tenney Crags. These rock features are unique on the landscape and provide habitat for a wide variety of bird species, including the peregrine falcon. Rock climbing of these features can reduce the nesting success as well as diversity of bird species (Hamann et al. 1999). Facilitated human access to these features increases the likelihood and frequency of this activity affecting nesting birds.

The recommended transportation system would reduce the extent of human activities that affect habitat. For example, the difficulty of accessing Tenney Crags would increase with the decommissioning of portions of Trails 666 and 667, reducing disturbance to nesting birds.

TW3: How does the transportation system affect legal and illegal human activities (including trapping, poaching, harassment, road kill, or illegal kill levels)? What are the direct and indirect effects on wildlife species?

The transportation system can facilitate human entry into the watershed for illegal activities. For instance, the trail system can be used to access the upper portion of the watershed more easily for illegal hunting. However, the transportation system can also encourage better legal hunter distribution and success in meeting CPW game management objectives, as well as provide routes for removal of game.

Sources of human activities or features that cause disturbance to soils and vegetation, such as unauthorized mining, are also found in the watershed. Roads and trails act as access points for the establishment of non-system routes associated with these activities. These routes reduce habitat suitability for wildlife species by increasing trail density, habitat fragmentation, and noise disturbance.

Wildlife mortality caused by vehicular traffic is most probable on High Drive. Traffic volume on this route can be high, but the potential for wildlife mortality is minimized by a seasonal closure, as well as constrained travel speeds because of road surface conditions and sinuosity.

The recommended trail system would reduce the extent of human activity, although it may also concentrate use on those trails that remain open. The effects of noise disturbance on wildlife

behavior would be reduced. Habitat availability and effectiveness would also increase as the human disturbances that influence energy expenditures decrease.

TW4: How does the transportation system directly affect unique communities or special features in the area?

The watershed contains the suitable habitat for several species (other than the greenback cutthroat trout) listed as threatened under the ESA or designated as sensitive in Region 2 of the USFS. The watershed contains suitable habitat for the Preble's meadow jumping mouse (PMJM) and Mexican spotted owl (MSO), both federally listed threatened species. The PMJM is restricted to patches of riparian and adjacent upland along streams below 7,600 feet in elevation (USFWS 2003). An estimated 441 acres of this habitat is concentrated in the eastern portion of the watershed along about 1.5 miles of Bear Creek. The MSO inhabits forested habitats or deep rocky canyons that possess complex structural components and cool microclimates (USFWS 2011). The watershed contains about 1,436 acres of moderately and highly suitable habitat for this species, some of which is designated as critical habitat. These species have not been documented in the area, nor have any inventories for these species been recorded. Region 2 sensitive species that may occur include the fringed myotis, hoary bat, olive-sided flycatcher, flammulated owl, northern goshawk, and peregrine falcon. The falcon was documented nesting in the Tenney Crags area in the 1980s. Other sensitive species have not been documented in the watershed, but are likely to occur in suitable habitat.

Riparian areas are unique and important communities because of their limited extent and high value to wildlife. The transportation system has caused loss of riparian vegetation where the trail system parallels or traverses Bear Creek and its tributaries. Recreational activities on the road and trail system near riparian areas can negatively affect these communities through the crushing or trampling of vegetation, or by inundating vegetation with sediment. These effects may reduce the suitability of these sites for use by wildlife. Riparian areas are particularly important to bat species, many of which subsist on insects that are most abundant over water or riparian areas. Riparian systems are also important to the American beaver. Beaver ponds are unique features in the upper portion of the watershed. Beaver impoundments such as these can often benefit species by increasing aquatic habitat area, improving water quality, reducing erosion, and reducing fluctuations in seasonal flows (Boyle and Owens 2007). The transportation system and sediment generated from the system have reduced or displaced woody deciduous vegetation or riparian cover and structure. This affects beaver habitat suitability by reducing the quality and availability of food and construction materials.

Decommissioning of portions of the trail system that parallel Bear Creek would improve habitat conditions along about 3.5 miles of the creek. This action would eliminate sources of disturbance to riparian vegetation generated by recreational activities, as well as the existing degraded trail conditions. Trail restoration would increase the habitat available to riparian dependent species by promoting the recovery of woody deciduous vegetation or riparian cover and structure. Improved habitat conditions, in particular, may promote beaver colonization or enhance distribution. The impoundments constructed by this species have the potential to improve habitat conditions further by increasing aquatic habitat area, improving water quality, and reducing erosion.

Ecosystem Functions and Processes (EF)

EF1: What ecological attributes, particularly those unique to the region, would be affected by introducing motorized use to currently non-motorized areas?

The establishment of motorized use in undeveloped portions of the watershed would cause an increase in road or trail density, increasing forest fragmentation. This action would also reduce vegetative cover, causing destabilization of soils and further impairing the hydrology of riparian systems. Motorized use may also increase the ecological consequences of invasive species infestations by facilitating the introduction or expansion of noxious weeds into uninfected portions of the watershed. Trails developed for motorized use may also increase effects associated with various forms of non-motorized human recreation.

The recommended transportation system would introduce motorized use only along the new Kineo Mountain trail and shift it slightly where Trail 701 is re-routed. The introduction of motorized use on these routes would further degrade trail conditions. The effects of recreation on the degree of degraded trail conditions are reduced on the non-motorized routes, but ongoing erosion is evident (F. Quesada, personal obs. 2011 and 2012). Motorized use would likely increase trail width and depth as well as causing additional erosion. This type of human recreation would function as an additional source of soil disturbance that increases sediment transport, affecting the riparian systems and water quality of Bear Creek.

EF2: To what degree does the presence, type, and location of roads and trails increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?

Roads and trails are potential avenues for the introduction and spread of non-native plant species, including noxious weeds. Winters and others (2004) noted that transportation corridors are the main sources of dispersal for various noxious weeds, with weeds usually colonizing disturbed or rocky areas along these features. The introduction or establishment of weeds and dispersal of weed seeds are generated from the various forms of human recreation. For instance, hay for pack animals and the resulting excrement are sources of weed seeds. Backpackers may import seeds on their equipment, and motorized vehicles are capable of distributing weed seeds over large areas in a short period of time (Douglass et al. 1999). The disturbance of soils by vehicles has long-term effects that favor the establishment of weedy species (Douglass et al. 1999). Invasive species are often well adapted to periodic disturbance (Cole and Landres 1995). Human activities that cause soil disturbance and the removal of vegetation can facilitate ground conditions for noxious weed establishment or expansion.

Invasive species introduction and spread has the potential to disrupt ecological integrity. The potential for the establishment of noxious weeds is greatly increased when environmental conditions are altered by disturbance, both natural and human, and when dispersal vectors are provided for the continued introduction of non-native plants into a given area (Winters et al. 2004). Species composition and vegetation structure can change because plants vary in their ability to resist being damaged, in their ability to recover from damage, and in their ability to flourish in the conditions that occur on disturbed sites (Coles and Landres 1995). The establishment or expansion of noxious weeds can displace native vegetation. In addition, noxious weed infestations are difficult to eradicate or control because of treatment methods, cost, and effectiveness. Noxious weeds that occur in or near water further complicate treatment because of difficulties with controlling the use of chemicals in an aquatic environment (Winters et al. 2004).

Non-native plant species are present but not abundant in the watershed. They are more common along High Drive than in the rest of the watershed. Noxious weeds known to occur include Chinese clematis (*Clematis orientalis*), bouncing bet (*Saponaria officinalis*), and Canada thistle (*Cirsium arvense*). Others are likely present, but not documented.

The road and trail system also facilitates recreational activities that have the potential to introduce or spread parasites and disease. In particular, contact between domestic dogs and wildlife may occur in the context of outdoor recreation. Diseases or parasites could be transmitted among species. Potential risks include the transmission of canine distemper, rabies, parvovirus, plague, and Giardia.

The recommended transportation system would not substantially decrease the risk of introduction or spread of exotic plant and animal species. Recreational use of the watershed would continue to be high, and as the prevalence of invasive species increases in the Colorado Springs area, so would the inherent risk of introducing exotic species into new areas in the watershed. Disturbed soil on closed routes would favor the establishment of weedy species until the sites can be restored. The lands surrounding High Drive would likely continue to be first affected by invasive species. Restricting use to system routes only would improve our ability to detect and control new infestations, as off-trail use could cause new infestations that would remain undetected for years.

EF3: To what degree does the presence, type, and location of roads and trails contribute to the control of insects, diseases, and parasites? EF4: How does the transportation system affect ecological disturbance regimes in the area?

Evidence of past insect infestations, such as elevated amounts of dead and down and standing dead trees, is common in the lower, eastern half of the watershed. An insect outbreak in the late 1980s caused extensive mortality in white fir and Douglas-fir in this area. Currently, only endemic levels of insects and diseases are present. Snag patches larger than five acres are found on some north slopes but are less common on south slopes.

In the event of an insect or disease outbreak, the road system would provide access to the eastern portion of the watershed for forest vegetation treatments. However, the trail system does not have the potential to accommodate the type of equipment that would be necessary for treatments of large infestations. Travel routes would facilitate access for manual vegetation treatments, but the extent of potential treatments would be limited by steep slopes and erosive soils. The recommended transportation system would measurably change this situation.

Although no specific records exist, there appears to have been a widespread fire in the upper part of the watershed about 100 to 120 years ago, as evidenced by old fire scars, burned logs, and the condition of the existing vegetation. An historic photograph of Jones Park and the area to the west shows forest cover to be largely absent, except for scattered patches of small conifers. Aspen may have been more abundant but the quality of the photograph is not good enough to make this determination. Fire return interval in this area is thought to be 120 to 150 years. Lower in the watershed, there is no evidence of past large fires, although several smaller fire scars in the 10 to 50 acre range were found. Areas with Gambel oak are decadent and show little fire activity in the last 100 years. Fire return interval in dry mixed conifer, ponderosa pine, and Gambel oak is thought to be 20 to 50 years.

The transportation system may disrupt the natural disturbance regime of wildfire in the Bear Creek watershed. The potential for high fire intensity and growth is elevated because of accumulated fuel conditions and slope. The use of roads and trails as control features during fire

suppression is not practical because of topography. Roads and trails also increase the risk for wildfire as the system allows access for human activities that are a potential ignition source. Human-caused fire may be caused by arson, as well as accidental causes. Unintentional ignitions may occur from recreational shooting, an escape from a prohibited campfire, or flammable debris from a motorcycle lacking a spark arrestor. These ignition sources are a risk to the watershed because of the period of use and location of these activities. These activities occur more frequently during warmer and dryer environmental conditions and are often located on the lower portion of the slope. Wildland fire originating from the transportation system may cause detrimental effects to the watershed, as fire behavior would be influenced by topography. Vegetative recovery from a high severity fire would be prolonged because of the very erosive granitic soils common in the watershed.

The recommended transportation system would reduce the risk of human ignitions by reducing the extent of motorized travel. This change would be most pronounced along Bear Creek, where parts of Trails 666 and 667 would be closed. By reducing the risk of human-caused ignitions close to Bear Creek, the risk of adverse watershed effects from wildfire would also be reduced.

EF5: What are the adverse effects of noise caused by developing, using, and maintaining roads and trails?

Human recreational use is the main source of noise generated from roads and trails. This source of noise primarily affects wildlife species. Wildlife response to noise causes physiological and behavioral responses that can reduce reproduction and survival. For instance, noise impedes or causes wildlife daily, seasonal, or dispersal movements. Adverse effects to wildlife include increases in energy expenditures, displacement in population distribution or habitat use, and a reduction in productivity.

Noise also exacerbates the problems posed by habitat fragmentation and wildlife responses to human presence (Barber et al. 2009). Noise disturbance may reduce habitat suitability and deter occupancy by those species that require isolated areas, such as nesting raptors. Raptors may be incapable of becoming habituated to the existing level of human noise. Effects of raptors reacting to disturbance include increased energetic demands, nest abandonment, and avoidance flight and exposure to predators.

Noise disturbance is most pronounced on motorized trails. However, according to Barber and others (2009), animal responses most likely depend upon the intensity of perceived threats rather than on the intensity of noise. For example, Youmans (1999) noted that in circumstances where motorized use is predictable and localized (for example, confined to routes); animal response to humans on foot may be more pronounced than it is to motorized vehicles.

Reduced trail density associated with the recommended transportation system would redistribute recreational activities. The effects of noise disturbance on wildlife behavior would be reduced. Habitat availability and effectiveness would also increase as the human disturbances that influence energy expenditures decrease.

Economics (EC)

EC1: How does the transportation system affect the Agency's direct costs and revenue? What, if any, changes in the transportation system will increase net revenue to the agency by reducing cost, increasing revenue, or both?

Although the trail system falls on lands managed by the PSICC, CSU, and the City, as well as lands owned by private entities, the USFS is responsible for maintaining health and human safety on the entire trail system through the use of federally funded trails crews, partnerships, and volunteer labor. The majority of High Drive is owned by the City, but portions are also managed by the USFS and owned by private entities. Ownership of roads and trails is shown in Table 2.

No easement exists granting the City right-of-way for the 1.5 miles of High Drive on NFS lands; however, the City maintains the road in its entirety under informal agreement. The cost of maintaining the full length of High Drive has been included in this analysis, as there is no formal maintenance agreement guaranteeing future maintenance by the City. Maintenance of the portion of High Drive on NFS lands would be about $2,600 per year if the City did not maintain it. The maintenance required to keep High Drive open and safe for public access is central to the economic efficiency analysis of this watershed. Table A8 shows the estimated annual costs incurred by the USFS and City for the existing transportation system. It is important to keep in mind that these are estimated annual costs and that maintenance costs can fluctuate greatly from year to year depending on weather events.

Table A8 Transportation System Annual Costs

Activity	Funding Source	Average Annual Cost
Trail Maintenance (USFS)	USFS - CMTL	$1,360
Road Maintenance (City)	City	$12,500
Weekly Road Patrol (City)	City	$2,300
	Total	$16,160

The analysis area is not a fee-use area so the transportation system does not generate any direct revenue from user fees. The outfitter and guide permits that include use of the Bear Creek watershed rarely use the area because of limited access so it is assumed there is not any revenue generated from outfitter and guide use. In 2012, two permitted recreation events passed through the Bear Creek watershed. It was the first year for both races, so participant numbers were low. The permits only generated the minimum fee –$132.55 each – as fees for recreation events are based on event revenue.

Although the transportation system generates relatively little direct revenue for the USFS, it has historically produced a substantial amount of grant funding and volunteer labor. Table A9 shows the average amount of grant funding that has been generated for maintenance and improvement of the transportation system over the past five years (2008 through 2012). Grant funding has substantially reduced the need for appropriated funding in the Bear Creek area.

Table A9 Transportation System Grant Funding

Activity	Funding Source	Average Annual Funding
Trail Maintenance (USFS Crew)	State of Colorado, OHV Grant	$2,100
Trail Maintenance (Youth Corps Crew)	State of Colorado, OHV Grant	$2,800
USFS Employee Salary and Trail Maintenance Supplies	State of Colorado, OHV Grant	$5,000
Trail Maintenance (Contract Labor)	Colorado Motorized Trail Riders Association (CMTRA)	$50,000
Trail Maintenance Supplies	CMTRA	$5,000
Trail Maintenance (Youth Corps Crew)	CMTRA	$5,600
	Total Annual Grant Funding	$70,500

The transportation system does not support timber harvest; therefore, no revenue is derived from timber sales. Similarly, the transportation system does not support mining or oil and gas leases so no revenue is generated from these activities.

The recommended transportation system would decrease trail mileage, which should decrease annual trail maintenance costs in the long-term. In the short-term, construction of new and re-aligned trails, as well as rehabilitation would increase costs substantially. The recommendations include keeping both motorized and non-motorized trails open in an effort to implement a transportation system that is aligned with anticipated future maintenance funding. Thus, it is reasonable to assume that the transportation system would merit consideration for grant funding commensurate to previous years. The recommendations also include establishing clear ownership and maintenance responsibility for High Drive, which would ensure that the Forest Service does not incur future costs maintaining and patrolling the road.

EC2: How does the transportation system affect the priced and non-priced consequences included in economic efficiency analysis used to assess net benefits to society?

It is not possible to perform a comprehensive economic efficiency analysis on the existing transportation system because data for costs and revenues are not collected in a way that represents specific trails with the required degree of accuracy. However, this transportation analysis considers several areas related to economic costs and benefits such as recreation, aquatic habitat, fish, wildlife, and water quality.

The question of whether a specific investment will cost more or less than the value or benefit it produces is central to economic efficiency analysis. Priced costs for the transportation system include the costs of planning, re-routing, maintaining, improving, and decommissioning roads and trails. Priced benefits include revenues for receipts from special use permits, grant funding, and volunteer hours generated to maintain or improve the transportation system, and support for the local economy from recreational use.

A specific investment may also include non-priced costs or benefits that cannot be expressed in dollars. Non-priced costs may include development of previously undeveloped areas and

degradation of wildlife habitats. Non-priced benefits could include recreation experiences provided free of charge, improvements of existing problems along roads and trails that affect aquatic habitats, and improved water quality. Water quality and aquatic habitat improvement is of particular importance as recent studies have shown that Bear Creek is the location of the last surviving wild population of the greenback cutthroat trout.

The priced costs of the recommended transportation system would include the cost of planning and building the new Kineo Mountain trail and re-route of Trail 701, as well as rehabilitating the trails that would be closed. Priced benefits including grant funding, volunteer hours, and support for the local economy from recreational use of the transportation system may remain unchanged, as there would still be many recreational opportunities in and around the watershed for a variety of user groups.

The recommended transportation system would protect habitat for the greenback cutthroat trout while still allowing for a wide variety of recreational use, both of which are consequential non-priced benefits. Building the new Kineo Mountain trail would lead to non-priced costs including development of previously undeveloped areas and possible negative effects on wildlife habitat. In addition, the recommended transportation system would restrict access to single-track trails immediately adjacent to Bear Creek, which would be a consequential non-priced cost.

EC3: How does the transportation system affect the distribution of benefits and costs among affected people?

The majority of people who use the Bear Creek area are residents of Colorado Springs and surrounding communities in El Paso and Teller counties. These are the people who are most likely to be affected by the transportation system and the activity it supports. As of July 2011, El Paso County had a population of 636,963 and Teller County had a population of 23,356 (U.S. Census Bureau 2012).

It is not possible to quantify the direct financial effect of the transportation system on tourism in the region; however, tourism is the third largest employer in Colorado Springs, providing over 13,000 jobs to residents and generating $1.2 billion in revenue as of 2009 (Colorado Springs Convention and Visitors Bureau 2012). In terms of employment and income, tourism in the Colorado Springs area benefits directly from the transportation system in the Bear Creek watershed because of the popularity of Trail 667, the surrounding trail network, and the scenic mountain views from High Drive. The current transportation system also affords access to some of the best mineral collecting opportunities in Colorado including amazonite, fluorite, bladed hematite crystals, phenakite, smoky quartz, and topaz.

In addition to the direct financial benefits generated by the transportation system, it is also a valuable recreation resource. The primary user groups are motorized users and mountain bikers; however, temporary outfitting and guiding permits have been issued to senior and recreation centers for guided hiking. Recreation event special use permits have been issued for horse trail rides, mountain bike races, and foot races. Although this wide variety of user groups benefit from the transportation system, such a large volume of mixed use traffic can also create conflicts.

The recommended transportation system would most likely not affect the benefit of tourism to the Colorado Springs area as it allows for both motorized and non-motorized access as well as seasonal motorized access to High Drive. There is a chance that access to mineral collecting would be reduced because of the closure and rehabilitation of trails close to Bear Creek. Motorized users may also be negatively affected because of the closure of some motorized trails.

Construction of the new Kineo Mountain trail and conversion of portions of currently non-motorized trails to mixed-use would benefit motorized trail users. Special use permittees would benefit from the development and implementation of best management practices for special use events, as these BMPs would allow for sustainable recreational special events to continue in the future.

Timber Management (TM)

TM1: How does road and trail spacing and location affect logging system feasibility?

Logging system feasibility is not a concern with regard to the existing or recommended transportation systems because timber harvest is not a management objective in the Bear Creek watershed.

TM2: How does the transportation system affect managing the suitable timber base and other lands?
TM3: How does the transportation system affect access to timber stands needing silvicultural treatment?

Management of the suitable timber base and silvicultural treatments are not a concern with regard to the existing or recommended transportation systems because timber management is not a Forest Plan objective in the Bear Creek watershed.

Minerals Management (MM)

MM1: How does the transportation system affect access to locatable, leasable, and salable minerals?

The majority of NFS lands in the analysis area are open for mineral entry under the Mining Act of 1872 as amended and mineral leasing laws applicable to federally owned lands. About 280 acres at the west end of the watershed were withdrawn from mineral entry in 1913 when they were designated as part of the municipal watershed for Colorado Springs.

There are currently four active, unpatented mining claims in the area. Right of reasonable access for purposes of prospecting, locating, and mining is provided by statue. Such access must be in accordance with rule and regulations of the Forest Service. However, the rules and regulations may not be applied to prevent lawful mineral activities or to cause undue hardship on bon fide prospectors and miners. On an active mining claim, an operator is entitled to access in connection with operations, but no road, trail, bridge, landing area, or the like, shall be constructed or improved, nor shall any other means of access, including but not limited to off-road vehicles, be used until the operator has received approval of an operating plan in writing from the USFS when required.

High Drive provides motor vehicle access to the area's trail system for access to the mining claims. There are no leases for oil and gas or other leasable minerals, or contracts for salable mineral materials in the area. Currently, there is no documentation of Expressions of Interest or Notices of Intent is on file with the Pikes Peak Ranger District.

Actions to close and rehabilitate unauthorized trails, construct new trails, change the type of use, or decommissioning system trails may influence access mining claims. USFS representatives would need to coordinate with active mine claimants to approve access routes. Approval of the means of access as part of a plan of operations shall specify the location of the access route,

design standards, means of transportation, and other conditions reasonably necessary to protect the environment and forest surface resources, including measures to protect scenic values and to insure against erosion and water or air pollution.

Range Management (RM)

RM1: How does the transportation system affect access to range allotments?

The existing transportation system does not affect range management because there are no active allotments in the analysis area. The recommended transportation system would not change this situation.

Water Production (WP)

WP1: How does the transportation system affect accessing, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes?

Water uses on the National Forest may include diversions, impoundments, and distribution systems. Road access is usually needed to move in the equipment used to build and maintain these structures. Road access also facilitates the monitoring and operation of water systems. CSU has a water right and infrastructure in place to withdraw water from Bear Creek for municipal use; however, it does not currently use water from this stream. Municipal use of water from Bear Creek is planned in the future. The recommended transportation system would not change the ability of CSU to withdraw water from Bear Creek in the future.

WP3: How does the transportation system affect access to hydroelectric power generation?

There are no hydroelectric sites in or downstream of the analysis area; therefore, neither the existing nor recommended transportation systems affect hydroelectric power generation.

Special Forest Products (SP)

SP1: How does the transportation system affect access for collecting special forest products?

The existing transportation system is not used, nor is the recommended system expected to be used, for the collection of special forest products. If the collection of special forest products were to occur, the recommended transportation system would generally facilitate access for collection of small amounts of products (for example, the amount that could be carried on a motorcycle or by foot).

Special-use Permits (SU)

SU1: How does the transportation system affect managing special-use permit sites?

Trails in the analysis area are part of a popular network that provides a connection between the City of Colorado Springs and several city and county parks and open space areas on the east slope of Pikes Peak. Several long distance loop opportunities are available for races and events. The trail system is desirable for events and guided trips because of its proximity to Colorado Springs. Special use permits have been issued in the past for guided hunting, hiking, foot races, horse trail rides, mountain bike clinics and races, and to access mountain climbing areas. Historically, a

permit was issued for guided hiking on the Jones Park trails and for mountaineering on the peaks near Jones Park, although use of trails in Jones Park is no longer authorized.

The analysis area is located in Big Game Management Unit 59 and Sheep Unit 6. Currently, one transitional priority outfitter and guide permit is issued for guided sheep hunting in Sheep Unit 6, although the majority of the guided hunting occurs on the south and west slopes of Pikes Peak. Additionally, one transitional priority special use permit is issued for guided mountain lion hunting district-wide. Although Bear Creek is within these permitted hunting area, it is not likely used for bighorn sheep or mountain lion hunting because the area is generally outside the range for bighorn sheep, the prey for mountain lions is not prevalent, and access is limited and difficult (F. Quesada, personal communication). There is availability for an additional outfitter and guide special use permit for guided sheep hunting in Sheep Unit 6. The additional permit would likely be issued as a temporary one-year outfitter and guide permit as requests are received. Hunting outfitters generally park along NFS roads and hike into the forest to scout for game and lead their clients to hunting areas. Forest Service policy for administering permits requires one field inspection be performed for each outfitter and guide permit annually. No outfitter and guide permits authorize overnight camping in the analysis area. Therefore, field inspections for the outfitter and guide permits are not conducted in the Bear Creek watershed.

The Pikes Peak Range Riders have been periodically conducting their annual trail ride in the Bear Creek watershed since 1949. The ride begins in downtown Colorado Springs and travels up Trails 666 and 668 to Frosty Park and further west to the Range Riders' historical campsite near Gillett. The ride generally includes 125 to 150 horses and riders. In 2012, a one-year recreation event permit authorized a foot race on a portion of High Drive and Trail 665 for up to 60 participants. A one-year recreation event permit authorized an endurance mountain bike race on Trails 668, 701, 720, 667, and 665 for up to 200 riders. An application has been received to hold the foot race again in April 2013. There has been other interest in permits for bike races in the area in 2013, but no other applications have been received. The U.S. Army, Mountain High Altitude Helicopter Qualification/Training Program, based at Fort Carson, Colorado is authorized to use 16 landing zones on NFS lands under Special Use Permit PPK325 issued 04/16/2008 with expiration of 12/31/2018. Four landing zones are located in the Bear Creek watershed.

Recreation event permits generally authorize the use of designated roads and trails for races or rides. USFS policy does not require a field inspection for recreation events. If a field inspection were performed to determine if the event complies with the terms and conditions of the special use permit and operating plan, the area would be accessed by Gold Camp Road and NFSR 379 or Lower Gold Camp Road. Effects to roads from events that involve running, bicycles, or horses would be minimal. To determine effects to forest trails from recreation events, the field inspector would have to hike or ride the trails.

The development and implementation of BMPs for recreation event and outfitter and guide special use permits would reduce the risk of adverse effects to the watershed and greenback cutthroat trout. For example, BMPs may be used to ensure that participants stay on designated routes and avoid water contact. The use of BMPs would increase the importance of field inspections during recreation events or outfitter and guide activities to ensure permit holders are complying with the BMP requirements.

General Public Transportation (GT)

GT1: How does the transportation system connect to public roads and trails and provide primary access to communities?

There are no communities or developed parcels in the analysis area. High Drive bisects the area and connects to Lower Gold Camp road and Cheyenne road, which are public roads connecting to the greater Colorado Springs area. The trails in the analysis do not provide any primary access to communities. The recommended transportation system would not change this situation.

GT2: How does the transportation system connect large blocks of land in other ownership to public roads and trails (ad-hoc communities, subdivisions, inholdings, and so on)?

In addition to NFS lands, two large blocks of land in the watershed are owned by the City. The City manages the eastern block, Bear Creek Canyon Park, while CSU manages the western block (the Jones Park area). High Drive also provides access to seven patented mine claims under private ownership, which remain undeveloped. The recommended transportation system would not change this situation.

GT3: How does the transportation system affect managing roads and trails with shared ownership or with limited jurisdiction (RS 2477, cost-share, prescriptive rights, FLPMA easements, FRTA easements, Department of Transportation easements)?

There are no shared ownership roads. The only road in the area, High Drive, is managed by the City. No documentation has been found establishing ownership, rights-of-way, or easements for the portion of High Drive that crosses NFS lands. Similarly, no rights-of –way or easements are known to exist for any of the trails in the analysis. The recommended transportation system would not change this situation, except that formalization of the maintenance agreement for High Drive is one recommendation of this assessment.

GT4: How does the transportation system address the safety of users?

The multiple use single-track trail portion of the transportation system represents the largest risk to the safety of users. On single-track trails, passing space can be limited when parties traveling in opposite directions meet. Motorcycle riders, mountain bikers, equestrians, and hikers can all experience user conflict with their own and other user groups when sharing the trail system. Even on the non-motorized trails (for example, Trail 666) conflict can occur between users such as mountain bikers, hikers, and others. The high level of use of area trails increases this risk. Some user groups (for example, equestrians) may avoid the trail system in part because of the perceived risk of conflict with other user groups. At the same time, trail conditions serve to limit speed, reducing the amount of physical danger posed by encounters among user groups.

Travel on High Drive is not managed by the USFS, but by the City. This road is currently closed to motorized use in part because of safety hazards remaining after a flood event in August 2011. When it was open to motorized use, traffic was limited to licensed vehicle only, reducing the risk of conflict inherent with mixed traffic.

The recommended transportation system would not measurably change the safety of users.

Administrative Uses (AU)

AU1: How does the transportation system affect access needed for research, inventory, and monitoring?

The transportation system facilitates on-going monitoring of the greenback cutthroat trout population and its habitat. Both roads and trails are used to access the stream for this monitoring, which would be more difficult and time consuming without the transportation system. Other than monitoring of the greenback cutthroat trout, its habitat, and the road and trail system itself, there is no known research, inventory, or monitoring being conducted or planned in the watershed. The recommended transportation system would reduce access along Bear Creek for aquatic monitoring, although cross-country travel would still be possible and would meet the need for access.

AU2: How does the transportation system affect investigative or enforcement activities?

The transportation system is strongly related to enforcement activities. Generally, if forest visitors cannot easily access an area by road or trail the incidence of violations is very low. As a result, most violations occur close to either a road or trail. Law enforcement staff use the transportation system as a means of access to detect and investigate violations. In general, law enforcement staff spends very little time on the trail system other than occasional maintenance of signs and other improvements at the trailheads, so little information is available on what does or does not happen along the trail system. Few if any violations are recorded along the trail system each year, but this may be more a function of not having anyone there to observe more so than an actual lack of violations.

The mixed jurisdiction of lands in the watershed is another complicating factor. The USFS only has law enforcement jurisdiction on the portions of the trail system on NFS lands. The fact that much of the trail system is located on City and CSU lands contributes to the limited amount of patrol activity as well as the lack of reported incidents.

The recommended transportation system could affect enforcement activities in several ways. First and foremost, it would require additional resources to educate the public and enforce closure of trails that are decommissioned. Depending on the level of understanding and compliance with the closure, this could be a significant commitment of resources. On the other hand, reducing the extent of the trail system would reduce the need for patrol. If ownership were to be consolidated, options for enforcement could be improved because the USFS would have jurisdiction on a larger part of the watershed.

Protection (PT)

PT1: How does the transportation system affect fuels management?

Thick vegetation and heavy fuels are consistent throughout all elevations and aspects. Fuel loads average 25 to 30 ton per acre on north slopes and 15 to 20 tons per acre on south slopes High Drive provides limited access for fuel management projects, especially since a portion of the road runs through City lands and private inholdings. High Drive crosses steep slopes and is narrow with limited areas for log decks and no safe areas to establish turnarounds for equipment. To use High Drive to access fuel treatment areas deemed appropriate from an engineering and vegetation perspective would require agreements with the City and private landowners.

A road approaches the west end of the analysis area on lands managed by CSU. This road could be used to access the west end of the Bear Creek watershed. The road is maintained to a level suitable for logging equipment; however, accomplishing any fuel treatment in Bear Creek would require the construction of several miles of temporary roads for access into the watershed. These roads would have to be constructed to a level that chip vans (two-wheel-drive semi-trucks with low clearance) could safely use to haul materials out of the project area. This level of road construction may conflict with the goal of watershed protection and with the Forest Plan. Construction and use of these roads would also require an agreement with CSU.

The trail system provides little opportunity for access to potential fuel treatment areas. The trail system provides few anchor points for fuels projects as it primarily runs mid-slope in the lower portions of Bear Creek where the higher risk of large-scale fire exists. In the upper western portions of the watershed, there are some opportunities for hand thinning and piling along the trail; however, this would do little to reduce the risk to the watershed and fish.

The recommended transportation system would do little to change the current situation in terms of access, given the few options and limited opportunities for fuel treatment in the Bear Creek watershed.

PT2: How does the transportation system affect the capacity of the Forest Service and cooperators to suppress wildfires?

Pikes Peak Ranger District crews have responded to an average of two fires a year in this area over the last decade. District crews also respond to an average of three to four mutual aid fires on City or County lands below Bear Creek each year. To date, these fires have been limited in size, ranging from less than one acre up to 10 acres. Two-thirds of the fires have been human-caused, with the remainder caused by lightning. The risk of large-scale fire is high because of the human use of the area and the condition of the fuels, as evidenced in part by the 2012 Waldo Fire, which was visible from portions of the Bear Creek watershed.

The transportation system directly affects to ability of the USFS to suppress fires. Steep slopes and lack of roads largely prohibit use of engines and vehicles in general. The greater Bear Creek area has two to four fire starts a year with an average size of less than one acre. The common response to such fires is to drive as close as possible and then hike into the fire. Response time is greater than other areas of the district because of the current condition of the transportation system.

The recommended transportation system would further reduce access for firefighters because of the reduction in open trails. Road access would not change but trails would be reduced by about three and a half miles. Access would still be available, but would require cross-country hiking or use of aircraft to deliver firefighters.

PT3: How does the transportation system affect risk to firefighters and to public safety?

The current transportation system adds risk to firefighters and public alike. The topography in the watershed is a narrow long canyon that would likely have a chimney effect near the western end of the drainage. In 2012, a fire model was run under 90th percentile weather conditions using an actual ignition from 2011. General fire spread was upslope, up-canyon to the southwest. Large crown fire runs were the expected fire behavior on about 70 percent of the area. In the absence of fire suppression, about 50 percent of the watershed is expected to burn in the first 48 hours. The model did not assess the development of strong west winds, which are common with afternoon

thunderstorms or passage of a weather front, and would push the fire down out of the watershed into Colorado Springs, as was seen on the Waldo Canyon Fire.

Given the condition of the fuels and poor accessibility, any fire that escapes initial attack would likely burn a large portion of the watershed at high intensity. If this fire behavior were to occur, it would place an unknown, but potentially large number of forest users at risk. The trail system does not lend itself to moving people out of the canyon down the trail to safety. Forest users would have to use other trails to leave the area and find safety. Additionally, firefighters may not be able to enter the area if adequate escape routes and safety zones are not available. The road does not add any additional risk to firefighters or public.

The recommended transportation system may reduce the risk to the public because not as many people would be using the watershed. The risk of people being trapped by a wildfire in the Bear Creek watershed would be reduced. The risk to firefighters would not change because they would continue to follow the same guidelines relating to escape routes, safety zones, and other factors when engaging a wildfire in this area.

PT4: How does the transportation system contribute to airborne dust emissions resulting in reduced visibility and human health concerns?

Airborne dust emissions occur but do not seem to be high enough to reduce visibility or cause human health concerns. However, studies have shown that air quality can be affected when traffic raises fugitive dust and emits by-products of combustion. Because wind can disperse suspended particulates over long distances, dust can blanket plant foliage and disperse dust-adsorbed contaminants well beyond the immediate area being used. Primary combustion byproducts potentially affecting air quality include (but are not limited to) polycyclic aromatic hydrocarbons, sulfur dioxide (SO_2), nitrogen oxides (NO_x), and ozone (O_3) (Ouren et al. 2007). The recommended transportation system may reduce the amount of airborne dust emissions, especially along Bear Creek where trails are decommissioned and during the season that the trail system is closed to use. On the other hand, dust may increase along the remaining trails that are open to motorized use if the level of use is concentrated during the open season.

Recreation (RR)

RR1: What are the supply and demand relationships for motorized and non-motorized recreation opportunities?

The motorized trails are single track, motorized (motorcycle use only), which is unique in this area. These trails also have added value to mountain bike users, who favor a similar trail configuration. Motorcyclists and mountain bikers are the predominant users of the trail network. The main trailhead (Penrose) for the network is located at the east end of Trail 665 in North Cheyenne Canyon City Park within the city limits of Colorado Springs. The proximity of the trailhead makes access and use of the trail network very convenient and extremely popular with residents of the City. Riders can access this area after work and be riding within minutes of their residence. The next closest similar riding opportunity is a 45 to 60 minute drive from Colorado Springs.

The Pikes Peak Ranger District has 80 of its 230 miles of system trails open to motorized use. The trails in and around the Bear Creek watershed (665, 667, 668, 701, 720, and 720.A) are the only legal, single track, motorized trails on the District. There is a great demand in the motorized community for separation of OHV use (defined as vehicles less than 50 inches wide) and true

single-track motorcycle use. The demand for single-track motorcycle use far exceeds the currently available opportunities. The same distinction can be made for mountain bike use on single-track trails.

Non-motorized use of the area is primarily by mountain bike, although hiking and other uses occur as well, especially on Trail 666. Non-motorized users of the trail network generally have a high expectation of encountering a wheeled vehicle (motorcycle or mountain bike). Bear Creek City Park and Red Rocks Canyon City Park provide more than 40 miles of non-motorized trails on the western side of Colorado Springs, helping to meet the demand for non-motorized recreation outside of the analysis area.

The recommended transportation system would reduce the supply of both motorized and non-motorized recreation opportunities, especially single-track motorcycle trails close to Colorado Springs. Non-motorized use may shift to other nearby opportunities.

RR2: Is developing new routes (motorized or non-motorized), decommissioning of existing roads and trails, or changing the maintenance of existing roads and trails causing substantial changes in the quantity, quality, or type of motorized and non-motorized recreation opportunities?

Several multiple-use trails (Table 2) provide the primary focus for recreational activities. Most are open to motorcycle use and all are open to non-motorized use. Trail 667, also known as the Captain Jack's trail, is widely recognized as a premium single-track route that requires a degree of skill in operating an off-highway motorcycle. Combined with Trails 668 and 701, Captain Jack's provides a high quality loop route that is unique in this area. The primary access and trailhead for motorcycles is Trail 665, located on lower Gold Camp Road in North Cheyenne Canyon City Park. This access is within the city limits of Colorado Springs and is within a 20-minute drive of over 600,000 residents of El Paso County. The trail is heavily used by motorcycles on an average of nine months a year. Snow conditions can limit its use in the winter.

This area is also popular for mountain bicycling, an activity that has steadily increased over the past 10 years. The majority of users shuttle bicycles up to the Frosty Park trailhead then ride Trail 701 across to Trail 667, coming out in North Cheyenne Canyon City Park or Bear Creek City Park. The amount of non-wheeled use is limited because of the high volume of motorcycles and mountain bikes. Even though this trail is easily access by an urban population, hikers have a greater expectation they will encounter a motorcycle or mountain bike and tend to avoid the area or limit use. Foot travel does increase during the three months or so when cold or snow limits wheeled vehicles. There are several surrounding trails for hikers including Red Rock, Bear Creek, and North Cheyenne Canyon City Parks in this immediate area. Most of the hiking activity is from homeowners who walk from their private residences onto NFS lands.

The area is not accessible by passenger vehicles, which restricts other forms of recreation. Occasionally, the public will camp at popular locations near the stream, although the watershed is currently closed to this use. Illegal squatters have been known to occupy campsites for long periods because of the proximity to the urban area. These camps are generally hidden and off main travel routes. The area receives very little hunting or fishing pressure and is currently closed to fishing to protect the greenback cutthroat trout. Equestrian use is limited because of the lack of facilities, the distance to ride and transport horses, and the potential for conflict with wheeled users.

CSU and Colorado Springs Park, Recreation, and Culture Services have completed a Master Plan for opening and developing the south slope of Pikes Peak for day-use activities. Implementation

of this plan is currently on hold. Access to the area would be from National Forest System Road (NFSR) 379, an hour drive from Colorado Springs. Near Lake Moraine, the west end of Trail 667 would connect to this road. If this plan is implemented, use is expected to increase, with additional mountain bike and possibly equestrian activities. Motorcycle use would not be permitted on this section of the trail.

The Ring the Peak (RTP) Trail was initiated more than 25 years ago. It consists of a collection of trails, four-wheel drive roads, and paved roads that circumnavigate Pikes Peak. The RTP Trail is approximately 63 miles long and 80 percent complete. About five miles of Trails 667, 668, and 701 are designated as part of RTP Trail between Frosty Park and Bear Creek City Park. Most use of this trail in the watershed is from runners, hikers, and mountain bikes coming from the west in an attempt to complete the loop back to Colorado Springs. It is estimated that less than 500 trips are made annually through this area.

Any change to the current types and legal access of routes in the analysis area would be a substantial change, especially for motorcycle and mountain bike users. Some of the factors influencing the significance of the change would be proximity to the urban area, trail network connectivity, often year-around access, high user volume, and the unique nature of the opportunity (single-track motorized). The locations and characteristics of each route are the very reasons individuals use the area whether their use is motorized or non-motorized. The primary change with the recommended system would be the loss of some single-track motorized trails, which are limited in availability in the general area. Some non-motorized routes would be lost as well, but other options exist around Colorado Springs and nearby.

The recommended transportation system would reduce the amount of both motorized and non-motorized opportunities available, which would not be entirely offset by the construction of new routes. The changes would also decrease the quality of the experience for some users, particularly with the decommissioning of parts of Trails 666 and 667, which provide some of the highest quality scenery in the area.

RR3: What are the adverse effects of noise and other disturbances caused by building, using, and maintaining roads and trails on the quantity, quality, and type of motorized and non-motorized recreation opportunities?

With the location of the Penrose Trailhead within the city limits of Colorado Springs, the potential for conflict with non-motorized activities is intensified. Noise and other disturbances can disturb wildlife and degrade the quality of recreational opportunities for non-motorized users. Most motorcycle use in the analysis area is round-trip, either out and back, or looping through various trails to the trailhead. The west end of the "Captain Jack's" trail network (Trails 665, 667, 668, 701, 720, and 720.A) is at NFSR 379 at Frosty Park. This road is a popular and heavily used four-wheel drive route with mixed traffic (licensed and unlicensed vehicles) and extensive dispersed recreational use. Several illegal, single-track routes have developed in this subalpine setting. The main roads back to Colorado Springs prohibit unlicensed motor vehicles, which causes the majority of motorcycles to return to town using either Trail 701 or Trail 668 back through the Bear Creek watershed.

It is estimated that more than 30 percent of the motorcycles using these trails do not have USFS approved spark arresting devices on their exhaust system. This can lead to noise levels above state requirements and a higher risk of wildland fires. The jurisdiction of Penrose Trailhead is unclear and currently little or no enforcement is done at this location. Noise and other effects from motorized recreation almost certainly have reduced non-motorized use of the trail system.

The decommissioning of trails in the Bear Creek watershed that are part of the recommended system would reduce the adverse effects of noise and other disturbances, especially along Bear Creek and in the Jones Park area. However, even non-motorized use of this area would be prohibited, so it would not be a benefit to users or improve the quality of the recreation experience. This would be offset by reduced disturbance to wildlife and improved watershed conditions.

RR4: Who participates in motorized and non-motorized recreation in the areas affected by constructing, maintaining, and decommissioning roads and trails? RR5: What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available? SI10: How does road and trail management affect people's sense of place?

The users of the transportation system in and around the Bear Creek watershed are diverse and numerous because the analysis area is located on the outskirts of Colorado Springs. Many of the users and user groups have strong attachments, opinions, and feelings about the area and its recreational opportunities. Convenience and proximity to the population base, the unique and historic motorized single track, and the quality of natural experience all contribute to a strong sense of place for many users. Some users have worked for many years to improve sustainability of the trails through collaborative volunteer efforts and feel significant attachment to the area.

The recommended transportation system is not expected to change the types of users of the roads and trails. There is likely to be significant concern on the part of the many users about the loss of certain opportunities. This is expected to be particularly acute with loss of access to Jones Park and surrounding areas along Bear Creek because this area is central to many users' interest and sense of place. Non-motorized users are likely to be concerned with the conversion of a portion of Trail 622 to motorized use, which would change the recreation experience.

RR6: How does the transportation system affect the Scenic Integrity? How is developing new roads and trails, decommissioning of existing roads and trails, or changing the maintenance of existing roads and trails affecting the Scenic Integrity?

Despite its urban setting, with residential sub-divisions surrounding the area to the east, scenic integrity is very high. The mountainous terrain screens views of the urban area from many points along the transportation system. The Pikes Peak massif to the west enhances views from within the watershed. Most evidence of human use is subordinate to the natural landscape. Recommended changes to the transportation system are not expected to affect the scenic integrity of the area.

Passive-use Values (PV)

PV1: Do areas planned for transportation route entry, closure, or decommissioning have unique physical or biological characteristics, such as unique natural features and threatened or endangered species (see TW4).

The entire Bear Creek watershed is considered an area of exceptionally high importance for aquatic species because of the presence of the greenback cutthroat trout. All potential activities in the watershed, such as changing the type of recreational use or constructing, reconstructing, or decommissioning roads or trails, may affect the greenback cutthroat trout as well as habitat for the federally threatened Mexican spotted owl and Preble's meadow jumping mouse. Connected activities in the adjacent North Cheyenne Creek watershed have the potential to affect the same

species. The recommended transportation system may lead to improved watershed health and aquatic habitat, which would be beneficial to the greenback cutthroat trout.

PV2/PV3: What, if any, groups of people (ethnic groups, subcultures, and so on) hold cultural, symbolic, spiritual, sacred, traditional, or religious values for areas planned for road or trail construction, closure, or decommissioning?

At the time of early Spanish incursions into Colorado, the mountains and the western slopes were considered Ute territory, while the eastern plains were occupied by several different groups. The territory of the Comanche and Kiowa was in the Arkansas River Basin and the territory of the Arapaho and Cheyenne was to the north in the Platte River Basin. All these tribes made use of the territory in and around the Bear Creek area. In the summer, they gathered at their sacred grounds in *Garden of the Gods Park*. The Utes called Pikes Peak *Tava kiev* or "Sun Mountain." The mountain is a very spiritual part of their territory.

Through the late 19th century, historical accounts show that Ute Indians continued to travel through local canyons during their trips between the western mountains and the eastern plains. The Utes, who may have been following the paths of earlier Indian groups, used North Cheyenne Canyon as hunting grounds and for replenishing during their journeys. The Cheyenne Indians used the canyon in the same way as the Utes (hence, the canyon's name). Beyond food procurement and shelter, Cheyenne and Arapaho people may also have been attracted to the local canyons because their waterfalls offered them spiritual inspiration (Unknown 2012).

With the arrival of the first settlers in the 1860s, the Ute and Cheyenne found themselves increasingly pushed away from their traditional travel routes and lands. In the 1880s, during Helen Hunt Jackson's advocacy for the purchase of North Cheyenne Canyon and conversion into a public park by the City of Colorado Springs, she "*expressed particular interest in preserving the canon because of its historic and traditional importance to the Ute and Cheyenne Indians*" (Bonds 2008).

During their journeys between their summer and fall hunting grounds to/from their winter campgrounds, the Utes travelled along multiple trails established across the foothills of Pikes Peak. Old Ute trails were commonly used by early explorers and settlers. One of the most famous and most highly used Ute trails was an old buffalo trail that came to be known as the *Ute Pass Trail*. Today, it is roughly followed by the path of U. S. Highway 24.

In the analysis area, the earliest trail depicted on historic maps is the Bear Creek trail (Trail 666 and the part of Trail 667 along Bear Creek). It is possible that the Bear Creek trail follows an earlier Indian trail. According to Brunk (1994), Bear Creek trail was a defined trail by as early as the 1860s and was used in 1873 as access to the US Army Signal Station on the summit of Pikes Peak via Mystic Lake, later known as Lake Moraine).

A traditional cultural property can be a site, a structure, an object, a landscape, or a natural resource feature assigned traditional, legendary, religious, subsistence, or other significance by a cultural group. Despite clear evidence of use and sacred significance of adjacent localities, the USFS has no present knowledge of cultural, symbolic, spiritual, sacred, traditional, or religious values specific to the areas planned for road or trail construction, closure, or decommissioning. In January of 2013, the USFS initiated tribal consultation through written communications to the designated cultural representatives of the federally recognized tribes with a connection to the area. Tribes contacted include the Cheyenne and Arapaho Tribes of Oklahoma, the Northern Arapaho Tribe, the Northern Cheyenne Tribe, the Uintah and Ouray Reservation Ute Indian

Tribe, the Ute Mountain Ute Tribe, the Jicarilla Apache Nation, the Kiowa Tribe of Oklahoma, and the Comanche Nation of Oklahoma. Through consultation, the USFS seeks to identify areas that may be of importance to the local tribes so that they may be considered early in the project planning process. To date, we have no knowledge of traditional cultural properties in the analysis area.

PV4: Will road and trail construction, closure, or decommissioning substantially affect passive-use value?

Passive-use value is a value or benefit that people receive from the existence of a specific place, condition, or thing, independent of any intention, hope, or expectation of actual, active use. Activities such as hiking, mountain biking, and OHV riding are examples of active use. Passive-use value consists of existence value and bequest value. Existence value is the value or benefit people receive from knowing that a specific place, condition, or thing exists, independent of their actual use of that specific place, condition, or thing. Bequest value is the value or benefit people receive because a specific place, condition, or thing is available for active or passive use by others.

Most people hold passive-use values for an area because of the presence of unique or rare resources such as T&E species, spectacular scenic views, pristine wilderness, unusual geologic or natural conditions, or unique cultural resources. Where these resources are abundant or particularly unique, the passive-use value of an area can exceed its value for active use. The presence and use of roads or trails can reduce the passive-use value of an area if they detract from or damage the resource on which the passive-use value is based.

On the other hand, some people may hold higher passive-use values for areas when roads or trails are present. For example, some people may not be able to use the trail system in Bear Creek because of age, disability, or other factors. However, they may hold passive-use values for the area because other members of their family or community enjoy using the trail system.

While there are likely some people, both locally and nationally, that place a value on the existing transportation system, the greatest value associated with the transportation system is actual use, particularly the well-known “Captain Jack’s” trail. Conversely, there are likely many more people, both locally and nationally, that place a high passive-use value on the existence of the unique greenback cutthroat trout population, even though they will never see it or use it in an active sense.

Many people who use the analysis area for recreation are likely to feel reduced passive use values because they would know that they cannot use the area. On the other hand, some people may experience increased passive use values because they know the watershed is being managed to provide for improved watershed health and habitat for greenback cutthroat trout.

Social Issues (SI)

SI1/SI2: What are people’s perceived needs and values for access, roads, and trails? How does transportation system management affect people’s dependence on, need for, and desire for access, roads, and trails?

The transportation system in the Bear Creek watershed receives a high level of recreational use and allows recreationists to connect to other trails. Several of the trails provide the only single-track motorized trail that is immediately accessible from Colorado Springs. Residents of the

Colorado Springs area place a high value on their ability to access the transportation system in Bear Creek. This is reflected, in part, by the existence of several local, non-profit trail advocacy organizations. These organizations contribute various levels of fiscal and volunteer support to maintain portions of the trail system, further reflecting the value they place on access and trails. These groups have a strong sense of involvement and ownership in the transportation system they have supported over the years.

The City of Colorado Springs Parks department budget was cut from $17 million to $3 million in 2010. The budget cuts have not decreased people's needs and values for access, only the City's ability to maintain their road and trail infrastructure. The effects of reduced budgets and deferred maintenance can clearly be seen on High Drive and the trails in Bear Creek Canyon Park. Use of the roads and trails remains high, even on High Drive, which has remained closed to motorized use since August 2011 because of storm damage and deferred maintenance.

Recommended changes to the transportation system may be difficult for some users to accept depending on how their specific form of recreation is affected. The Bear Creek Roundtable was established in 2011 with the intent of providing a forum for interested local organizations to hear and discuss current information regarding Bear Creek, and to work together on solutions for the watershed. It is hoped that by working within the Roundtable forum, and by providing an open watershed assessment process, we will be able to reach a tolerable outcome for those in the community that place a high value on using the transportation system.

SI3: How does the transportation system affect access to paleontological, archeological, and historic sites?

A record search and literature review identified two cultural resource surveys and four recorded cultural sites, all historical. No prehistoric sites have been recorded. Two of the sites, the Colorado Springs / Cripple Creek railroad grade and the North Cheyenne Canyon Park historic district are listed in the National Register of Historic Places (NRHP). One site, mine ruins, was determined not eligible to the NRHP. The fourth site, the Seven Lake Toll Road, needs additional data to determine eligibility to the NRHP.

Prehistoric properties are sites with materials and items common to the American Indian cultures of Colorado. The use of these sites usually pre-date AD 1860, and could be thousands of years older. No prehistoric properties were identified during a records search or literature review; however, the potential exists for the discovery of such sites. Several tribes, including the Utes, Comanche, Kiowa, Arapaho, and Cheyenne made use of the area. Though not documented, it is possible that several of the historic trails were developed on older American Indian trails.

Historic properties are sites with materials and items common to European immigrant cultures of the western frontier. The Bear Creek watershed is rich in history, starting before the earliest maps and claims of 1874. This history includes the beginnings of the tourist industry for Colorado Springs, as well as the association with access to the summit of Pikes Peak, access to Cheyenne Park, and the enjoyment of the natural wonders of the immediate area. Other historic themes of significance are travel, mining, homesteads, reforestation, and modern recreation. However, most of the history of the Bear Creek watershed is associated with Bear Creek Trail, the original trail that led to the summit of Pikes Peak.

Preliminary background research on historic roads and trails in the analysis area identified that all system roads and almost all system trails are historic properties. The background research also highlighted some social trails that are historic properties and some additional historic trails that

appear to be no longer in use. High Drive is associated with the historic Trail to Pikes Peak, General Palmer, North Cheyenne Canyon Park, Ellen Elliot "Captain" Jack, and several New Deal programs. The Bear Creek trail, along with a portion of the Jones Park trail, was used in 1873 as the original trail to the summit of Pikes Peak. It was used by the U. S. Army to access their Signal Station on the peak. Other trails provided access to and connections with other historical sites. Several historic mine sites exist, including one adit adjacent to Trail 667. In 1892, lands were set aside under the Pikes Peak Timber Reserve, now a part of the PSICC. From 1904 through 1909, the USFS had an experimental nursery at Jones Park. The only two trails that do not appear in any of the historic references consulted are Trail 720.A and a segment of Trail 701. Even these could turn out to be historic after additional research. While extensive data collection and analysis is still needed, it is possible that High Drive and other routes are potentially eligible to the NRHP. In addition, the concentration of historic features suggests that Bear Creek area has potential as a historic district. The recommended transportation system would eliminate use of some of these historic routes and would eliminate access to various historic sites and features found along their path.

Cultural resources include not only historic roads and trails, but also include numerous historic sites with associated artifacts and features, as well as any undiscovered cultural properties. Being the historic connector, the current transportation system provides direct access to these sites and features. Under the recommended transportation system, system trail access to certain sites of interest to the public (such as Jones Park, Loud's Cabin, and the Adit) would be eliminated, while system trail access to other sites (such as Nelson's Camp and Clement's Cabin) would be retained.

The Bear Creek watershed is part of a story of high hopes for profitable ventures that catered to a growing spirit of adventure and awe towards the natural world. Sadly, the story of the Bear Creek watershed is also one of unfulfilled dreams of making it big. However, its historic significance has not changed much to the present day, and the area's trails remain heavily used by Colorado Springs residents. Roads and trails in the area provide opportunities for cultural resource interpretation. This could be enhanced through road and trail maintenance or trail use changes. Much of the information found on the internet today highlights historical and cultural sites in the area. Various webpages describe and map the system and social trails that lead to historic features of the area. Public use of the historic sites in the Bear Creek watershed will likely continue because of the draw of the area's history.

Although access increases the possibility of vandalism and looting at heritage resource sites, it can also be desirable for public visitation and interpretation. This is the case for the analysis area. The existing transportation system already contributes to the use and enjoyment of historic structures and features. It would be desirable to maintain access to interpreted heritage sites. In some cases, access is also desirable for maintenance and protection of historic structures. Given that some of the sites on the area are the ruins of log structures with interpretive potential, access not only would provide access to the public, but would also provide access to firefighters in the event of wildfire, and would allow for easier detection of illegal activity. By eliminating direct access to various historic properties, the recommended transportation system would reduce the possibility of vandalism and looting, while also making surveillance more difficult and reducing the likelihood of capturing illegal activity. Public access to historic properties located off the recommended transportation system would likely continue because of the area's historic appeal, requiring frequent monitoring and enforcement. It would be desirable to allow permitted access to these historic properties for interpretation purposes to mitigate the proposed access restriction.

There are no known paleontological sites in the Bear Creek watershed or along surrounding trails.

SI4/SI9: How does the transportation system affect cultural and traditional uses (such as plant gathering and access to traditional and cultural sites) and American Indian treaty rights? What are the traditional uses of animal and plant species in the analysis area?

The National Park Service defines a traditional cultural property as "a property that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community properties" (Parker and King 1998). A traditional cultural property can be a site, a structure, an object, a landscape, or a natural resource feature assigned traditional, legendary, religious, subsistence, or other significance by a cultural group.

The USFS has no knowledge of traditional cultural properties in the Bear Creek area. However, the USFS has initiated tribal consultation through written communications to the designated cultural representatives of the federally recognized tribes with a connection to the area. Tribes contacted include the Cheyenne and Arapaho Tribes of Oklahoma, the Northern Arapaho Tribe, the Northern Cheyenne Tribe, the Uintah and Ouray Reservation Ute Indian Tribe, the Ute Mountain Ute Tribe, the Jicarilla Apache Nation, the Kiowa Tribe of Oklahoma, and the Comanche Nation of Oklahoma.

The USFS is seeking this exchange in accordance with several laws, including Section 106 of the NHPA. The implementing regulations of this act (36 CFR 800) state that federal agencies must consider the effects of any proposed project on significant sites, giving consideration to the views, if any, of interested persons. Specifically, the regulations say that when an undertaking may affect properties of historic value to an Indian tribe on non-Indian lands, the consulting parties shall afford such tribe the opportunity to participate as interested persons. These regulations also provide for consultation to identify cultural resources by seeking information in accordance with agency planning processes from local governments, Indian tribes, public and private organizations and other parties likely to have knowledge of or concerns with historic properties in the area.

At present, the USFS has received no communication from these tribes or traditional practitioners regarding traditional use of the analysis area. Through consultation, the USFS seeks to identify any areas that may be of importance to the tribes so that they may be considered early in the planning process. The outcome will identify opportunities to improve management and provide recommendations for future action.

SI5: How does transportation management affect historic roads?

Management actions on roads or trails may affect cultural resources protected under the NHPA. As per NHPA, eventual land management decisions, such as trail closure, construction, obliteration, or continued use and maintenance, require a determination of effects of the specific actions on archaeological or historic properties. Consideration must be given to those effects that will occur immediately and directly, as well as those effects that are reasonably foreseeable and may occur later in time or be cumulative but still result from the undertaking.

The effects of land management decisions or actions need to be addressed at the site-specific level. An effect to a historic property occurs when an undertaking will alter those characteristics of the property that qualify it for the National Register [36 CFR § 800.16(i)]. When an effect to a cultural property is identified, the agency shall follow procedures set forth in 36 CFR 800 to complete the Section 106 process. Protection of cultural resources determined eligible for the

NRHP or which have not been evaluated and are considered eligible must be an important objective of travel management decisions and actions.

The following definitions should be used to distinguish between project effects:

> No Adverse Effect to cultural properties – occurs when an undertaking does not directly or indirectly alter or diminish the characteristics of a historic property that qualify it for inclusion in the NRHP.
>
> Adverse Effect to cultural properties – occurs when an undertaking directly or indirectly alters any characteristic or diminishes the integrity of a historic property that qualifies the historic property for inclusion in the NRHP. Although adverse effects under Section 106 of the NHPA may be mitigated, the effects nonetheless remain adverse.

When an undertaking directly or indirectly alters or diminishes the characteristics of a historic property already determined not eligible for listing in the NRHP by SHPO, or when there are no cultural properties present, the undertaking has "No Effect" to cultural resources.

Cultural resource sites can be put at risk by travel management actions or decisions. For example, ground-disturbing actions, such as those caused by road closure or maintenance activities, could directly damage a site. A change in use of a trail could indirectly damage a site, such as by causing additional ground disturbance. A management decision, such as closure of a trail with no on-the-ground action, could have the indirect effect of losing the feature to nature. This is of particular concern in the erosive environment of the analysis area. Retaining road access to a site could increase the possibility of vandalism and looting, particularly in isolated areas.

On the other hand, cultural sites can benefit from travel management actions or decisions. For example, closing a road near a cultural property hinders access and decreases the possibility of looting or vandalism. Where roads have bisected sites and affected their integrity, remnant deposits of sites could be preserved by stabilizing eroding surfaces, such as road cuts. Historic roads could be rehabilitated to their historic character. Continued use of a historic route could ensure its longevity. Cultural sites could benefit from improved road access in support of site maintenance and protection.

Because most routes in the analysis area are historic properties, care must be taken to ensure that the historic values of these historic travel ways are not adversely affected during transportation planning and use. Cultural sites can be at direct or indirect risk from road maintenance, construction, closures, and decommissioning activities. Even a '*No Action'* management decision could have an adverse effect on a historic property. This means that planners can expect to go through the Section 106 process for nay management decisions affecting transportation routes in the analysis area. Affected routes will need to be surveyed, recorded, and evaluated for NRHP eligibility, in conjunction with a determination of effects in consultation with the SHPO if an undertaking determination is made for a proposed action. The section 106 process will need to be followed for these historic routes for any management decision that could affect a cultural property. Whether proposed actions affect the qualities of the sites that make them eligible to the NRHP needs to be analyzed on a site-specific level.

Activities that affect cultural resources eligible to the NRHP are subject to Section 106 of the NHPA. None of the cultural properties in the analysis area has NRHP eligibility determinations. Currently, all sites have potential historic significance because they have not been evaluated against NRHP criteria of eligibility. If a NRHP eligible property were to be affected by a

proposed action, treatment measures would be recommended in consultation with SHPO. Treatment measures might include avoidance and protection of cultural sites and features, restoration of sites, or data recovery. If necessary and feasible, site avoidance could include relocation or redesign of project features.

Already, many of the travel routes have been adversely affected by motorized and non-motorized recreational use, erosion control and maintenance actions, as well as natural causes and neglect. In some areas, this may have caused obliteration or fragmentation. However, in other areas, intact segments may survive. For this reason, it is of great concern that travel management decisions may affect cultural resources protected under the NHPA.

Recreation trails in Colorado today, as in the past, have contributed a great deal to the development of tourism and mountain sports in Colorado, popular trades that bring economic benefit to the state. During travel management planning and management, care must be taken to ensure that the significant historic values are not adversely affected.

SI6: How may local community social and economic health be affected positively and negatively by transportation system management?

Management of the transportation system in the Bear Creek watershed likely has no measureable effect on the social and economic health of the Colorado Springs area, which has a large population and diverse economy. Nevertheless, the transportation system is important to the subset of local residents who actively use this area and to the businesses that support this use. The recommended transportation system is not expected to have any measurable effect on the economy or social health of the greater Colorado Springs area, although local users are likely to experience some loss of opportunities and experiences by virtue of not being able to use those trails that are decommissioned.

SI7: For communities adjacent to the Forest with industries dependent upon Forest-related resources, what are the local values of currently non-motorized areas surrounding the communities?

There are no industries dependent on forest-related resources in the traditional sense because Colorado Springs has a large and diverse economy. A few businesses (for example, those that supply recreational equipment) may derive some benefit from non-motorized use of the area. However, even for those businesses, the transportation system in the Bear Creek watershed likely serves only a small proportion of the total number of people who participate in non-motorized recreational activities in the greater Colorado Springs area. Any change to that level of use that relates back to recommended changes in the analysis area is not expected to be measureable.

SI8: How does transportation system management affect wilderness attributes?

The transportation system in the Bear Creek watershed does not affect wilderness attributes because there is no wilderness in or near the analysis area.

Civil Rights and Environmental Justice (CR)

CR1: How does the transportation system and its management affect certain groups of people?

All user groups have the potential to be affected by the management of the transportation system in an equal manner. The recommended changes would be made to both the motorized and non-motorized portions of the transportation system and could affect users. However, motorized and

non-motorized uses are not connected to a particular group in terms of ethnicity or income. There may be some connections with disability or age. Individuals with some disabilities or in an older age class may not be able to pursue non-motorized use (for example, hiking), but may be able to pursue motorized use of the area. The "Captain Jack's" and other trails require a high level of experience and physical ability that is not substantially different than the level of physical ability needed for non-motorized use. Therefore, changes to the motorized and non-motorized transportation system are not expected to affect particular groups of people in terms of disability or age.

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